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ABSTRACT

The document explains geographic concepts, products, and programs developed by the Census Bureau to assist users in analyzing census data for geographic areas. Emphasis is on small-area data such as census tracts, city blocks, minor civil divisions, incorporated places, congressional districts, and wards. Also presented are data for larger units including the United States, states and outlying areas, counties, and county equivalents. Types of data reviewed include outline maps, data display maps, geographic code schemes, reference files, and geography reference reports. Information is also presented on types of canvassing used in the 1970 census and on a technique called Dual Independent Map Encoding (DIME) developed after the 1970 census to transcribe geographic information so that it can be read and manipulated by computer. Maps, illustrations, and figures are presented for geographic areas of various sizes, census tract outlines, geographic identification code schemes, city reference files, and contents of a DIME-file record. The document concludes with an appendix presenting descriptions of areas associated with the 1970 census of population and housing and with the 1972 economic census. Also included is a directory of maps and files available from the Census Bureau. (DB)

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DAD No. 33
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Census Geography

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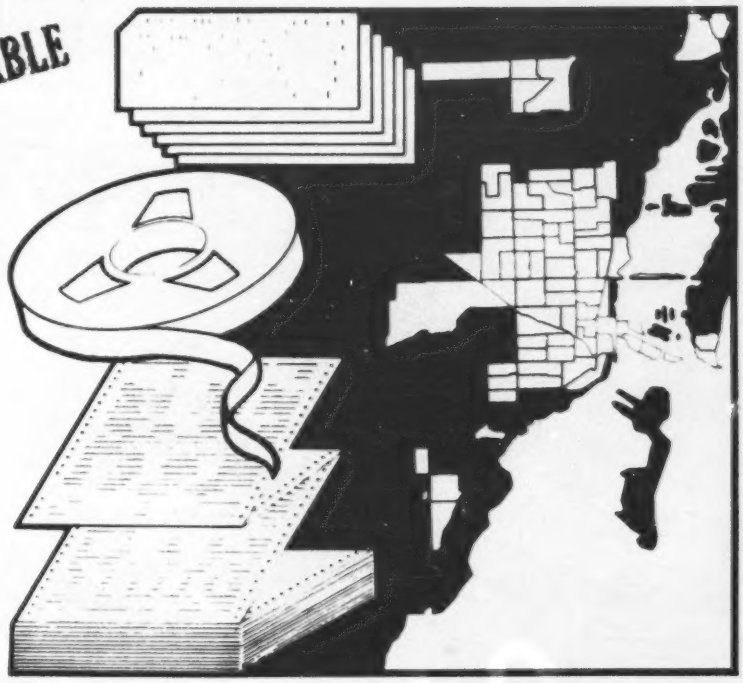

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Census Geography

INTRODUCTION

The purpose of **Data Access Description** (DAD), No. 33 is to explain geographic concepts, products, and programs developed by the Census Bureau. Census products and programs which assist users in the analysis of small-area data are emphasized.

Geography plays a crucial role in taking censuses and publishing the results for States, counties, cities, and smaller areas. The geographic work for a census basically consists of determining political and statistical boundaries, preparing the appropriate maps, and providing the technology for assigning the data collected on each census questionnaire to their proper geographic areas. This work has resulted in a number of tools and products that are helpful to the data user as well as to the Census Bureau, such as new types of maps, computerized geographic coding, graphic display systems, and ways of relating local data to census statistics for a variety of planning and administrative purposes.

The Census Bureau tabulates data for over 40 types of geographic areas in its many censuses and sample surveys. Figure 1 presents major geographic areas used in Census Bureau programs. Several principles concerning the general availability of Census Bureau data for geographic areas are worth noting and can be viewed in figure 1. For example, there are more geographic data for censuses than surveys. Within censuses, the decennial census of population and housing has more geographic detail than any of the other censuses.

While most Census Bureau data are tabulated for common geographic areas such as States, counties, and cities, most data programs present some data for special areas. The census of population and housing presents data for small areas such as census tracts and city blocks. In the census of retail trade, data are detailed for central business districts and major retail centers. Special travel regions and production areas are used in the census of transportation. The census of governments provides statistical information for a number of governmental units such as school districts and other special service districts. Foreign trade statistics are presented by country of origin and destination.

The most detailed small-area data are published in the decennial census. The 1970 Census of Population and Housing identified data for more geographic areas than any previous census. Figure 2 presents the geographic areas for which data were tabulated for the 1970 census. As figure 2 shows, the larger the geographic area the greater the detail provided in various tabulations. Also, more data for small areas are available on computer tape than appear in print. More information on data available from the 1970 Census can be found in **The 1970 Census and You** and **Data Access Description**, No. 39. "Reports Related to the 1970 Census of Population and Housing."

Corresponding information on the geographic coverage of economic census reports appears in the **Mini-Guide to the 1972 Economic Censuses** and the **Mini-Guide to the 1977 Economic Censuses**. While the 1977 Economic Censuses data, collected in 1978, will be available soon, the most current source for small-area economic statistics is the 1972 Economic Censuses data.

CENSUS GEOGRAPHIC AREAS

The boundaries of the geographic areas for which the Census Bureau collected and tabulated 1970 census data were established in several ways. Boundaries of governmental units—States, U.S. Congressional Districts, counties, minor civil divisions, incorporated places, and city wards—were based on information received from the appropriate government authorities. Boundaries of statistical areas were determined by the Census Bureau in cooperation with various groups of data users who offer advice and assistance to the Census Bureau. For example, the Office of Federal Statistical Policy and Standards of the Department of Commerce (formerly part of the Office of Management and Budget), with the assistance of other Federal agencies, defines standard metropolitan statistical areas (SMSA's). Functional or administrative areas are defined by other government agencies, such as the ZIP Code areas defined by the U.S. Postal Service. Several sets of geographic areas for which 1970 census data were tabulated—urbanized areas, census county divisions, unincorporated places, census tracts, enumeration districts, block groups, and blocks—were defined with varying degrees of local assistance at several levels of government, and by committees representing a broad range of data users.

Governmental units for which census data may be presented include:

- the United States
- States (and outlying areas)
- Counties (and county equivalents)
- Minor civil divisions (MCD's)
- Incorporated places
- Congressional Districts
- Wards (in selected cities)

Figure 1. **Major Geographic Areas Tabulated in Selected Census Bureau Programs**

Areas	Censuses										Current programs					
	Population and housing censuses			Economic censuses												
	Area reports	Subject reports	Census of governments	Retail trade	Wholesale trade	Selected services	Manufactures	Mineral industries	Construction industries	Census of agriculture	Population estimates	County Business Patterns	Annual Survey of Manufactures	Retail surveys	Current Population Survey	Annual Housing Survey
United States	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
Regions	a	s	a	a	a	a	a	a	a	a	c	c	a			a
Divisions	a	s	a	a	a	a	a	a	a	a	c	c	a			
States	a	s	a	a	a	a	a	a	a	a	a	a	a	s		
SMSA's	a	s	a	a	a	a	a				a	a	s	s		a
Counties	a		a	a	a	a	a	a		a	a	a				
Places	a		a	s	s	s	s						s	s		
MCD's	a															
CCD's	a															
Census tracts	a															
*ED's and block groups	a															
*ZIP code areas	a															
Wards	a															
Blocks	a															
Central business districts	c			a												
Major retail centers				a												

KEY

Note: Other areas unique to the population and housing census are urbanized areas, urban/rural, and congressional districts.

a All areas.
c All, by addition of components.
s Selected areas--larger or with more activity.
* Not in printed reports.

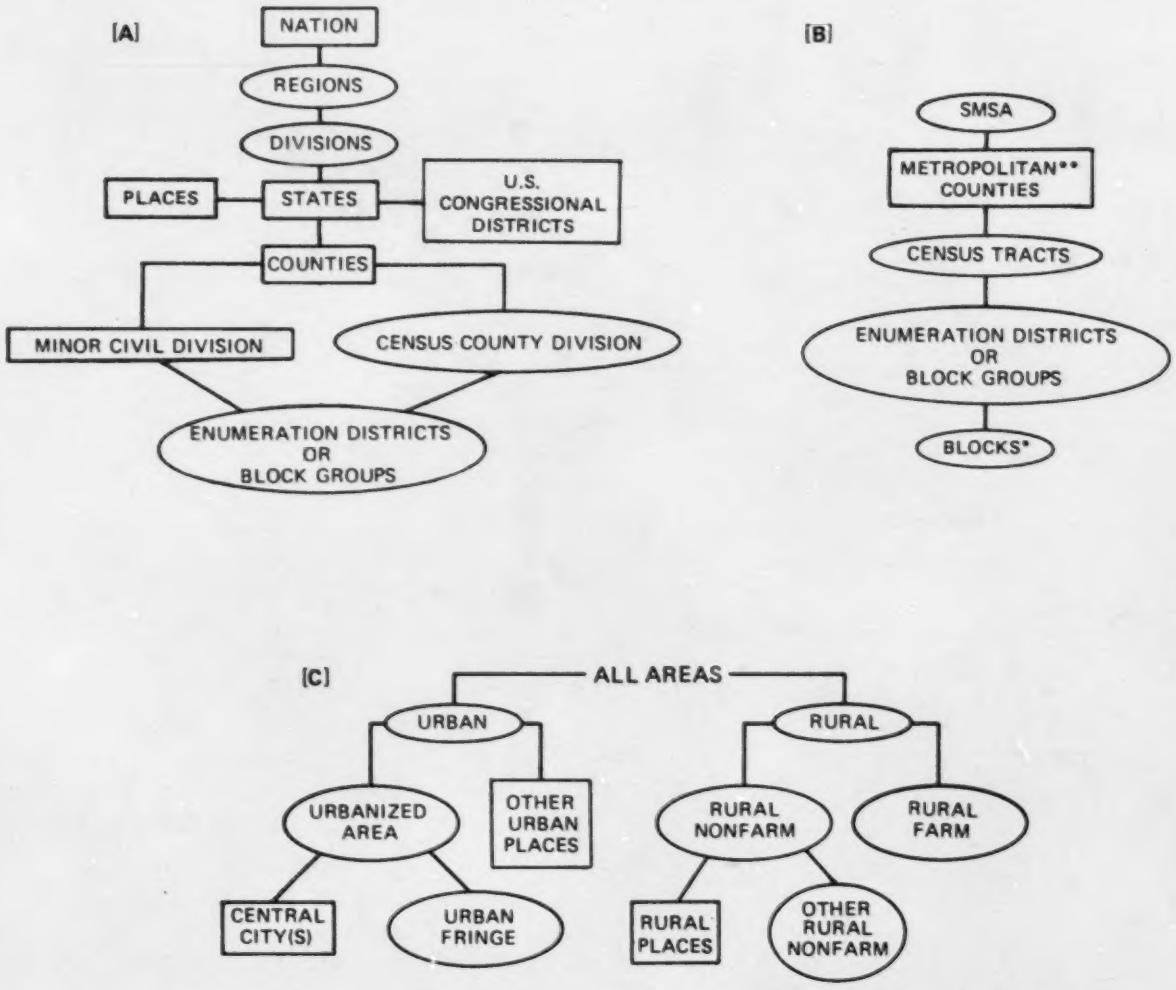
Figure 2. **Geographic Areas Summarized in 1970 Census Data Products**

Geographic area	Complete Count (100%) Data Only										Complete Count and Sample Data								
	First count				Second count				Third count		Fourth count				Fifth count		Sixth count		
	Summary tape	Microfilm	PC(1)-A[1]	HC(VI)[1]	Summary tape	PC(1)-B[1]	HC(1)-A[1]	PHC(1)[1] (part)	Summary tape	HCO[1]	Summary tape[2]	PC(1)-C[1]	HC(1)-B[1]	PHC(1)[1] (part)	Summary tape	Microfilm	Summary tape[2]	PC(1)-D[1]	HCO[1]
Blocks									x	x									
Enumeration districts or blockgroups	[4]A	x													C				
Census tracts					[4]A			x	([5])	([5])	[4]A			x	C				
Minor civil divisions or census county divisions	B	x	x		B	x					B				[6]C	x			
All places[6]	B	x	x												([7])				
Places > 1,000 only[6]					B	x	x												
Places > 2,500 only[6]											C	x	x						
Places > 10,000 only[6]				x															
Counties	B	x	x	x	B	x	x				C	x	x			x	[8]x		
Urban/rural parts of counties			x		B	x					C	x							
Standard metropolitan statistical areas	B	x		x	B	x	x	x			C	x	x				x	x	x
Urbanized areas of SMSA's	B	x	x		B	x	x				C	x	x						
Components of SMSA's					B			x			C						[8]x	x	x
Congressional districts	B	x													([9])				
State	B	x	x	x	B	x	x				C	x	x				x	x	
ZIP codes															A,B				

[1] Titles of these reports are given on file 4.2 and described in Data Access Description No. 39.
[2] On the fourth and sixth counts, population and housing data appear on separate files.
[3] MCD/CCD summaries are given only in counties with no census tracts.
[4] The first, second, fourth, and fifth counts have files designated A and B or A, B, and C.
[5] Tract totals appear for only that part of the tract which is covered by block summaries.
[6] Places include all incorporated places and unincorporated places of 5,000 or more in urbanized areas or of 1,000 or more elsewhere.
[7] Sixth count tapes provide data for metropolitan counties, central cities, and other cities over 50,000 population. Sixth count housing files also present data for nonmetropolitan counties of 50,000+.
[8] Data for small places can be created by aggregating summaries of component enumeration districts.
[9] The congressional district profile tape contains fifth count information and a few additional items.

NOTE: This figure appears as figure 6 in the Student Workbook.

Figure 3. **Census Geographic Units—Their Hierarchical Relationships**



These figures illustrate hierarchical or "nesting" relationships among census geographic areas. Note that the hierarchies overlap, e.g., counties are subdivided into MCD's or CCD's (figure A), into urban and rural components (figure C), and, inside SMSA's, into census tracts (figure B). Note also the relationships among governmental and statistical units as data summary areas.

KEY:
GOVERNMENTAL UNITS
STATISTICAL UNITS

*Blocks cover only the urbanized area of an SMSA

**In New England, metropolitan towns (MCDs) and cities replace counties as the components of SMSAs.

Figure 4. **Census Geographic Areas—Metropolitan**

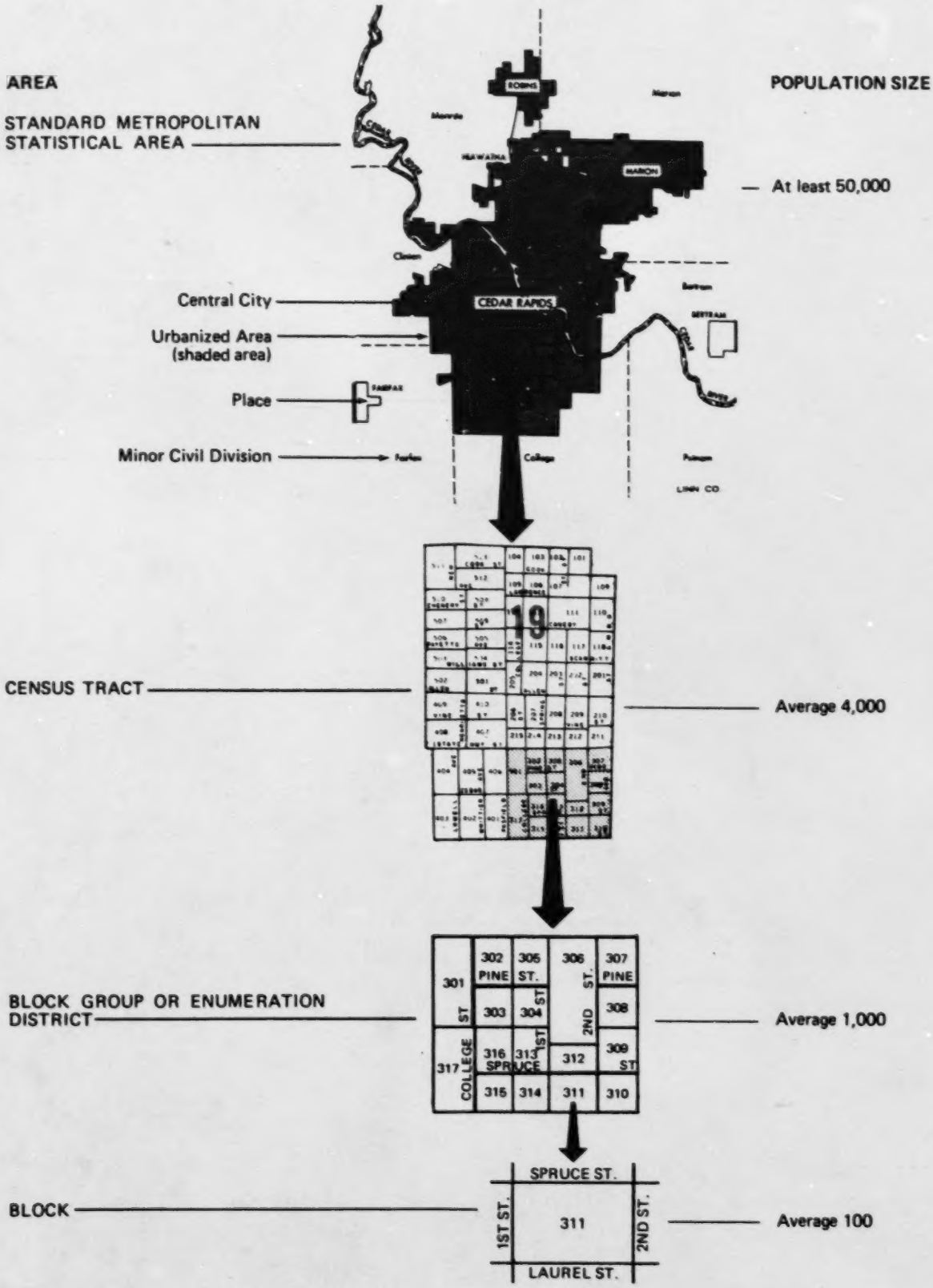
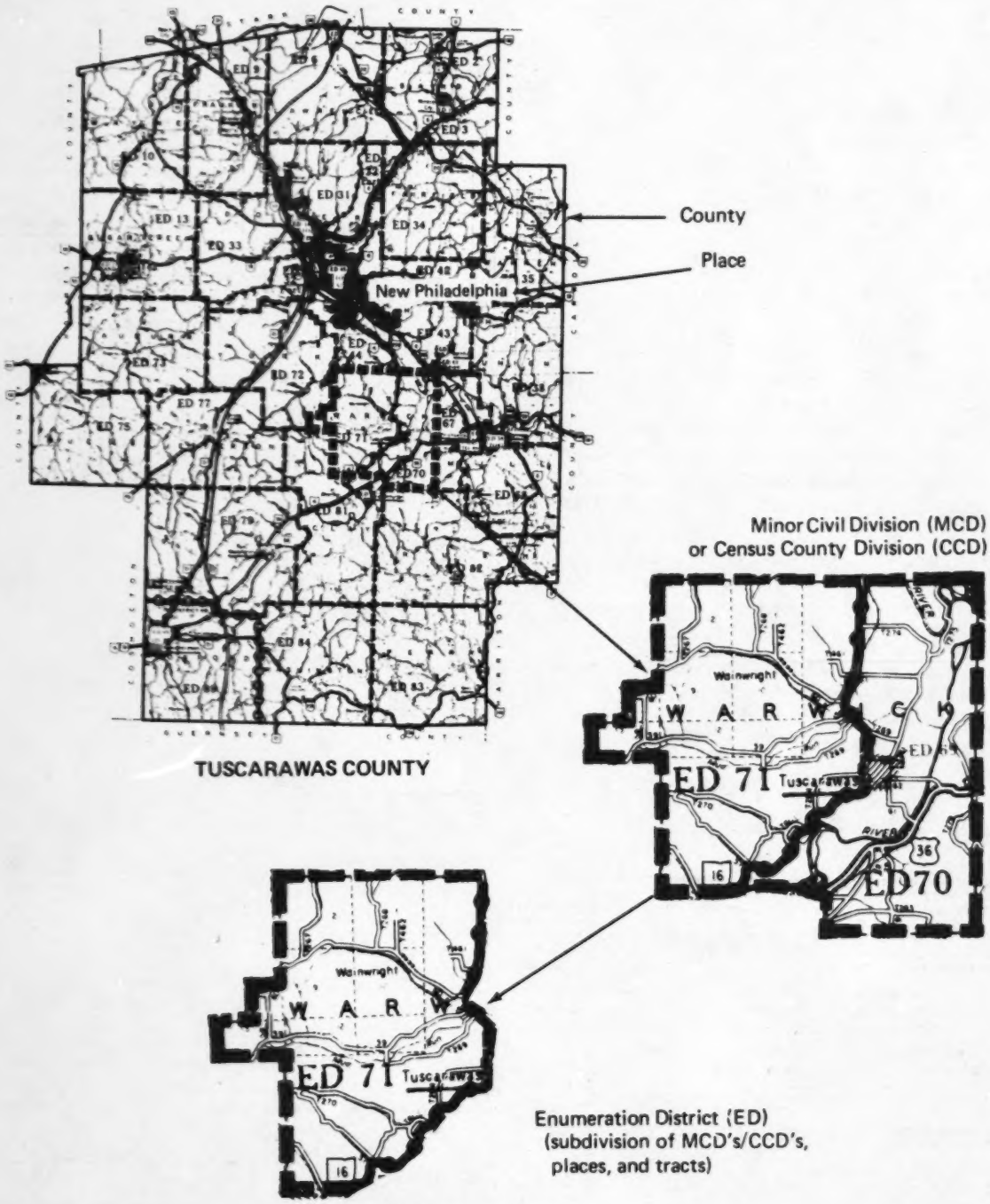


Figure 5. **Census Geographic Areas—Nonmetropolitan**



Statistical areas for which census data may be presented include:

- Geographic Regions of the United States
- Geographic Divisions of the United States
- Standard Metropolitan Statistical Areas (SMSA's)
- Urbanized Areas (UA's)
- Urban and rural areas
- Unincorporated places
- Census County Divisions (CCD's)
- Census tracts
- Enumeration Districts (ED's)
- Block Groups (BG's)
- Census blocks
- County groups (in the Public-Use Samples)
- State Economic Areas (SEA's)
- ZIP Code areas

The geographic areas observed in the 1970 census are defined in appendix A. More detailed definitions of geographic areas and related descriptive materials are presented in the "Census Users' Dictionary," pages 75-90, in the **1970 Census Users' Guide**, Part I; Chapter 3 of the **Reference Manual on Population and Housing Statistics from the Census Bureau**, and appendixes or introductory material of the various published statistical reports.

Definitions for geographic areas observed in the 1972 Economic Censuses are presented in appendix B, to the extent that they differ from areas recognized for population and housing censuses.

Most census geographic areas have well-defined hierarchical or "nesting" relationships with other types of areas, as illustrated by the three diagrams in figure 3. For example, States are aggregated to form divisions and regions; they also are subdivided into counties (parishes in Louisiana and divisions in Alaska), which in turn are further subdivided into minor civil divisions or census county divisions. Governmental units and statistical areas intermingle in all levels of these hierarchies. Not all of the geographic areas which can be aggregated into States are included in diagram A of figure 3. States are also composed of urban and rural components as illustrated in diagram C, a hierarchy independent of that shown in diagram A.

Figures 4 and 5 further illustrate the hierarchical relationships that appear for some census geographic areas. Figure 4 shows various geographic areas within metropolitan counties, areas which also appear in figure 3, diagram B. The figure also details the relationship between blocks, enumeration districts or block groups, and census tracts in SMSA's. Figure 5 shows the geographic components typical of a nonmetropolitan geographic area, which are also listed in figure 3, diagram A. Where census tracts and blocks are not defined, the primary statistical units within a county are minor civil divisions or census county divisions, which in turn are composed of enumeration districts.

OUTLINE MAPS

There are several series of outline maps which show census geography areas and define the boundaries for small areas: Metropolitan Map Series, county maps, place maps, tract outline maps, urbanized area maps, county subdivision maps, central business district and major retail center maps, and the United States map of counties. Figure 6 presents a summary of the characteristics of these maps and describes how they can be obtained.

Figure 6. **Census Outline Maps**

MAP SERIES	MAP SCALE	NUMBER OF MAP SHEETS	SIZE OF MAP SHEETS	AVAILABILITY	
				IN REPORTS	SEPARATE
METROPOLITAN MAP SERIES—cover urbanized areas of SMSA's and contain all census boundaries down to the block level	1" = 2,000	Varies according to size of urbanized areas	18" X 24"	HC(3)[3]	From $1.50 each sheet[1]
COUNTY MAPS—contain boundaries for MCD-CCD's, incorporated places, tracts, and enumeration districts	Generally, 1" = 2 miles	Varies from 1 to as many as 64 per county	Generally, 18" X 24"		From $1.50 each sheet[1]
PLACE MAPS—for incorporated and unincorporated places; contain tract and enumeration district boundaries	Varies according to size of place; range from 1" = 400' to 1" = 1,500'	Generally, 1 map sheet per place	Varies according to size of place	HC(3)[3],[4]	From $2.25 each sheet[1]
COUNTY SUBDIVISION MAPS—include township and city boundaries	Generally, 1" = 12 miles	Generally, 1 map sheet per state	3' X 4'	PC(1)-A	$1.00 each sheet[2]
TRACT OUTLINE MAPS—show tract boundaries and incorporated limits for places of 25,000 or more population	Varies according to size of SMSA and complexity of tracted area; range from 1" = ½ mile to 1" = 10 miles	Generally, 2 map sheets per SMSA	Generally, 22" X 24"	PHC(1)[3]	Prices vary see Appendix C[1]
URBANIZED AREA MAPS—show the extent of urbanized areas by grey shading	Generally 1" = 4 miles	Generally, 1 map sheet per UA	17" X 22"	PC(1)-A HC(1)-A	–
UNITED STATES MAP OF COUNTIES—contains boundaries for counties and equivalents	115,000,000	1 map sheet	30" X 40"	–	$1.00 each sheet[2]
CENTRAL BUSINESS DISTRICT MAPS—show census tracts comprising the CBD	Varies according to the size of the CBD	Single page	8½ X 11"	RC72-C	–
MAJOR RETAIL CENTER MAPS—show general location of MRCs and CBDs	Varies according to the size of the SMSA	Single page	8½" X 11"	RC72-C	–

[1] Available from: Customer Services Branch, Data User Services Division, Bureau of the Census, Washington, D.C. 20233 (301) 763-2400.
[2] Available from: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, or any U.S. Department of Commerce Field Office.
[3] Reports for some areas may be out of stock at GPO.
[4] Only for places participating in the contract block statistics program.

Figure 7a. **Segment of a Census Tract Outline Map From a PHC(1) Report**

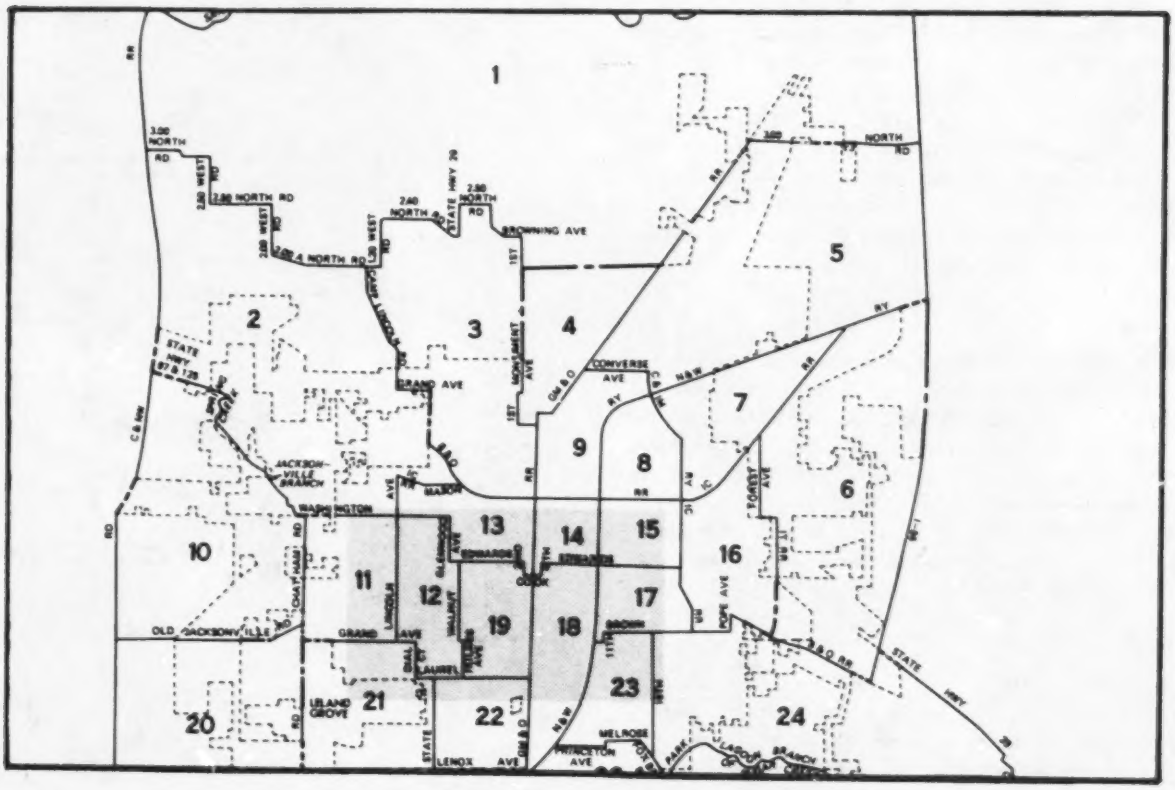
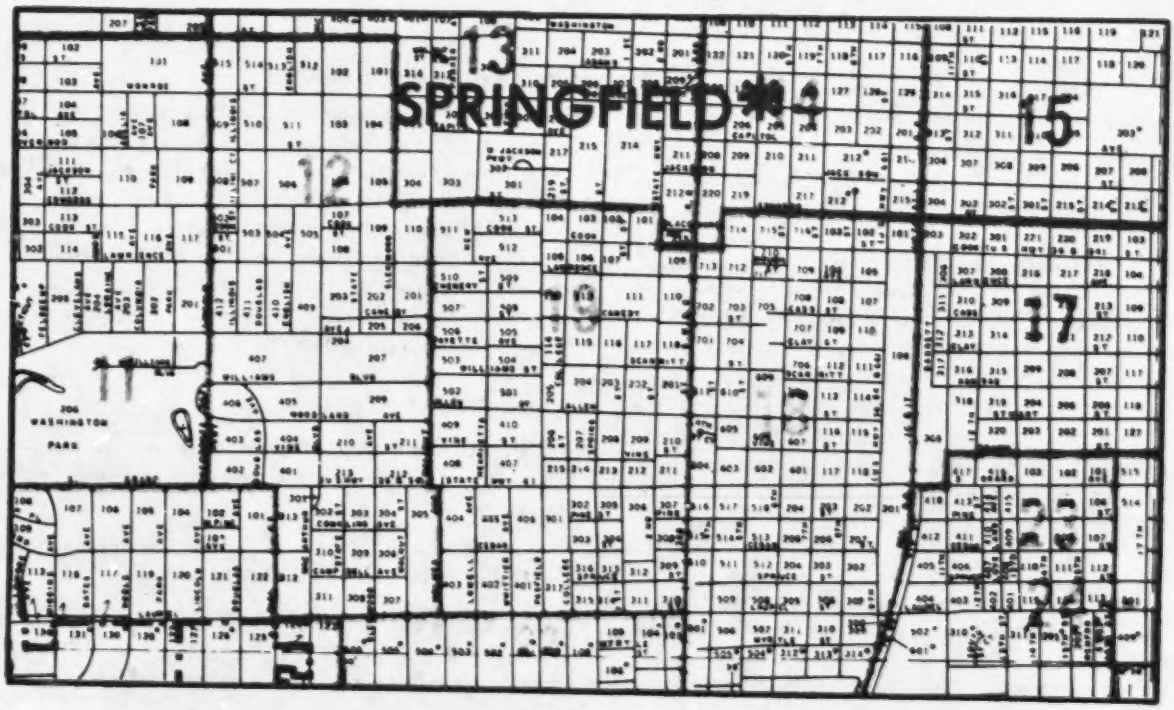


Figure 7b. **Segment of a Census Metropolitan Map From an HC(3) Report**
(Corresponds to shaded area above)



Metropolitan Map Series

Metropolitan Map Series (MMS) cover at least the urbanized area portion of 233 of the 247 SMSA's reported in the 1970 census. Each MMS sheet shows the names of streets and other significant features within the area covered. Boundaries and names (or numbers) of places, MCD's, CCD's, congressional districts, wards, census tracts, enumeration districts, and blocks are shown on MMS sheets, and block groups can also be ascertained from MMS sheets. A portion of an MMS sheet is shown in figure 7; a list of the areas for which these maps are available appears in appendix C.

County Maps

County maps show those portions of metropolitan counties not covered by the Metropolitan Map Series and the entirety of those counties outside of SMSA's. Boundaries of MCD's, CCD's, places, congressional districts, census tracts, and ED's are shown on county maps, except that ED's are not defined inside places for which place maps are available. County maps are generally reproductions of maps obtained from individual State highway departments, with census geography superimposed. The upper part of figure 5 shows detail from a county map.

Place Maps

Place maps are available for every incorporated and unincorporated place which was reported in the 1970 census but which was not included on the Metropolitan Map Series. Place maps, which are usually based on maps supplied to the Census Bureau by local agencies, identify streets and show boundaries for places, MCD's, congressional districts, and enumeration districts. Place maps also show census tracts where applicable and blocks if the place contracted with the Census Bureau for preparation of block statistics. Modified versions of place maps appear in the HC(3) **Block Statistics** reports for places participating in the contract block statistics program, but they do not show enumeration district boundaries. Figure 8 shows a portion of a place map.

Tract Outline Maps

Tract outline maps show the boundaries, numbers or names of census tracts, counties, and all places with a population of 25,000 or more for the 241 metropolitan areas tracted in 1970. Only streets and map features which form tract boundaries are shown on the maps. Generally, tract outline maps for an SMSA consist of one or two sheets, but can range up to five sheets for larger SMSA's. The lower part of figure 5 presents a portion of a tract outline map. A list of the metropolitan areas for which these maps are available appears in appendix C.

Urbanized Area Maps

Urbanized area maps show the extent and components comprising the 279 urbanized areas defined for the 1970 census with various gray shadings. More detailed delineation of urbanized area boundaries can be found in the Metropolitan Map Series. Figure 9 shows an urbanized area map.

Figure 8. **Detail From a 1970 Census Place Map**

County Subdivision Maps

County subdivision maps of States show the location and names of counties and the subdivisions of counties (minor civil divisions or census county divisions) as well as the location and names of all places which were recognized in the 1970 census. There is one map sheet for each State, with the exception of a few small States that have been combined on one sheet. The county subdivision maps, on a smaller scale, appear in sectionalized form in PC(1)-A **Number of Inhabitants** reports. Figure 10 shows a portion of a county subdivision map.

United States Map of Counties

The United States Map of Counties shows the location and names for all of the 3,141 counties and county equivalents used for the 1970 census.

Central Business District Maps

Central Business District maps show the boundaries and identification of the census tracts that make up the CBD, and show street detail within the CBD as defined for the 1972 Census of Retail Trade.

Figure 9. **Example of an Urbanized Area Map (Michigan)**

MICHIGAN

Urbanized Areas

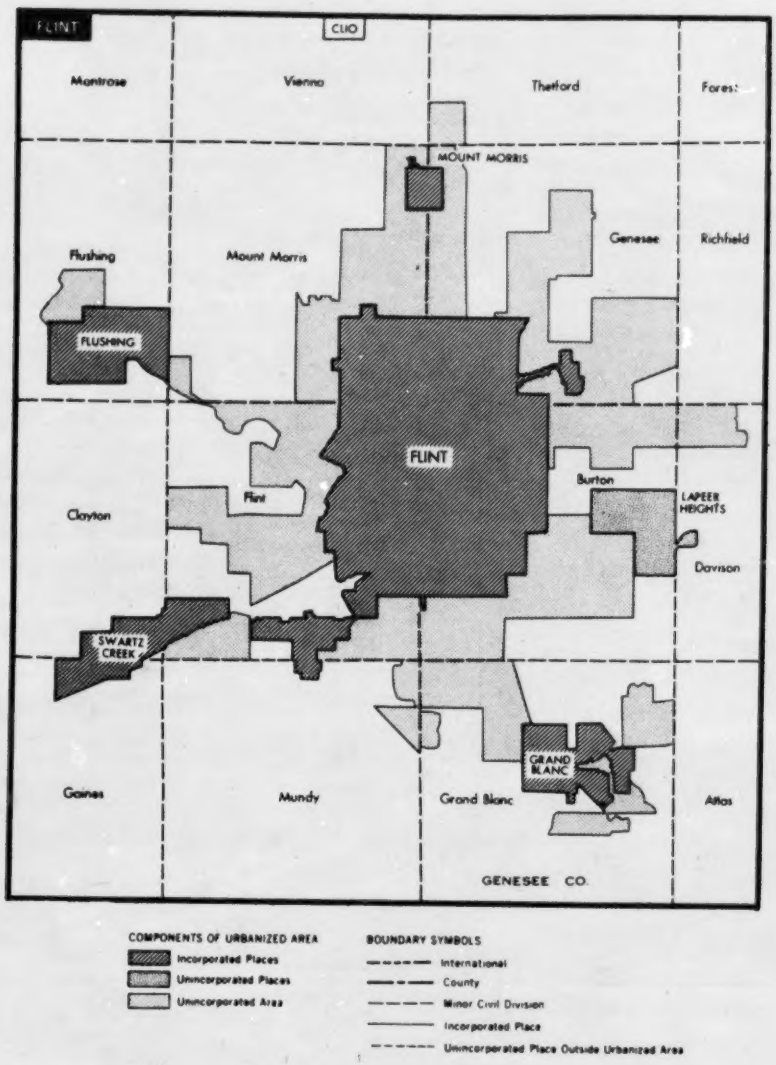
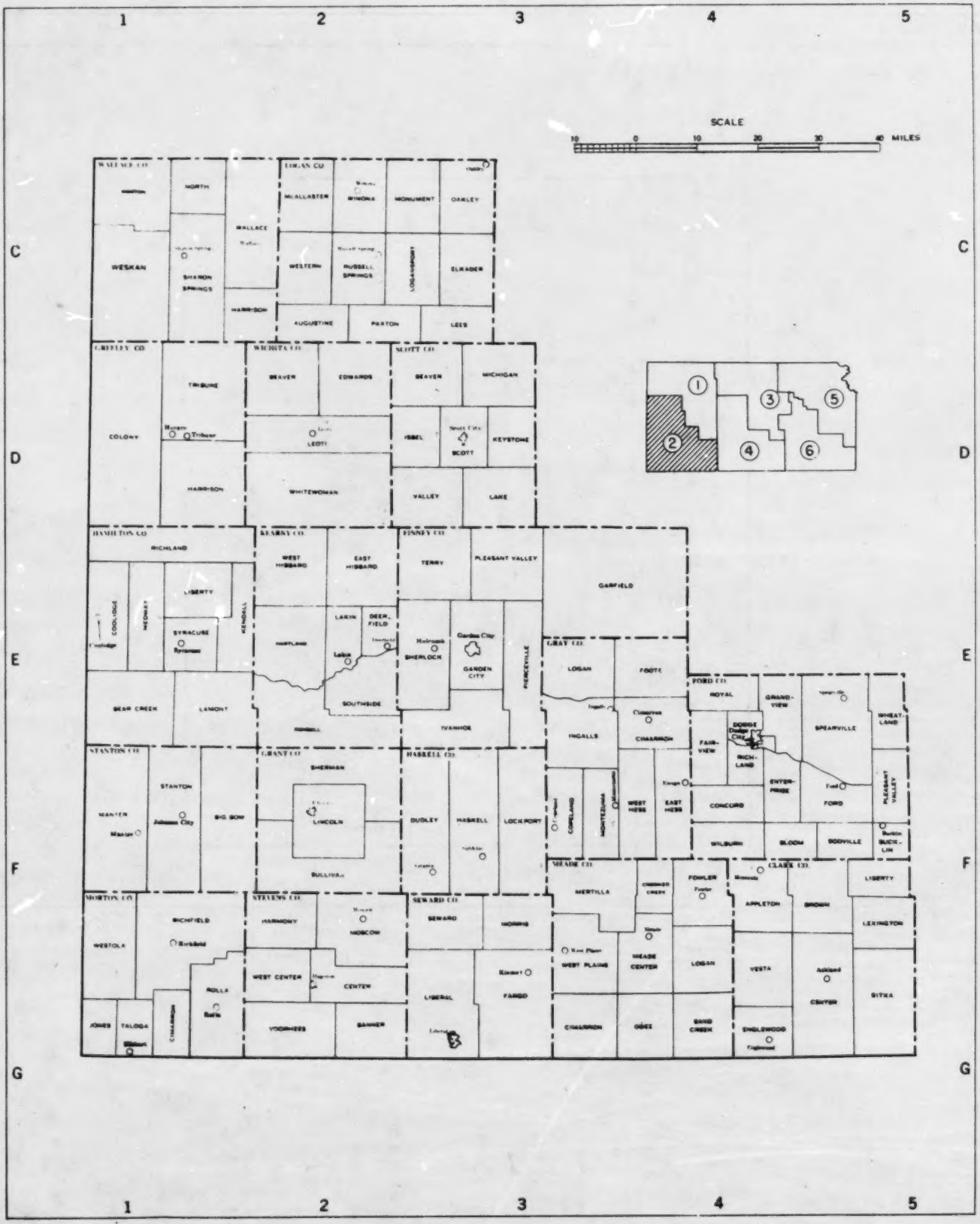


Figure 10. **Portion of a County Subdivision Map (Kansas, Section 2)**



Major Retail Center Maps

Major Retail Center maps show the location, but not the boundaries, of Central Business Districts and Major Retail Centers within an SMSA, as defined for the 1972 Census of Retail Trade. Only major streets are shown to assist in locating the MRC. The map scale is small enough to show all MRC's within a metropolitan area on a single page. The boundaries of MRC's are defined in a separate narrative in the 1972 Census of Retail Trade.

The Census Bureau maintains an inventory of the Metropolitan Map Series, county maps, and place maps, listing the cost and required number of map sheets for each State, county and place. Inquiries about particular areas may be directed to the Data User Services Division (phone (301) 763-2400).

DATA DISPLAY MAPS

The Bureau of the Census issues several series of statistical maps and graphic summaries which portray various kinds of census data. The GE-50 and GE-70 maps series present data for the entire nation by county. The GE-80 **Urban Atlases** series shows information by census tract for 65 selected SMSA's. Graphic summaries in book form have been issued for the censuses of population, housing, agriculture, and governments.

The GE-50 series consists of statistical maps which show the geographic distribution, by county, of various social and economic censuses, and other sources. Different color schemes are used to depict values of the data; county names and boundaries are easily seen through the color. Each map is a single sheet, 30 by 42 inches in size, at a scale of 1:5,000,000. Titles and prices of available GE-50 series maps are listed in appendix D.

The GE-70 series is at a smaller scale, 1:7,500,000, and measures 20 by 30 inches in size. The first map in this series portrays the 1970 population distribution as white dots on a dark background suggesting a nighttime view of the United States as it might appear from a high altitude. The second map shows the interrelationship of two data variables, people 65 years of age and older cross-classified with the census year in which each county attained its maximum level of population. Types of primary home heating fuels used for 1950, 1960, and 1970 are presented on three maps appearing as GE-70, No. 3. Specific titles and prices are listed in appendix D.

The **Urban Atlases** portray data by census tract from the 65 largest SMSA's (minimum population, 500,000). The **Urban Atlases** display, on individual maps, 12 selected data characteristics from the 1970 Census of Population and Housing. The **Urban Atlases** serve as graphic supplements to individual PHC(1) **Census Tracts** reports. Atlas sheets measure 19 by 22 inches and are printed in color. Large SMSA's are displayed on more than one sheet to provide legible depiction of data for small census tracts. Prices range from $2.55 to $7.05. The SMSA's for which atlases are published are listed in appendix C along with prices. The 12 population and housing characteristics mapped for each standard metropolitan statistical area are:

1. Population density (population per square mile)
2. Percentage of the total population under 18 years of age
3. Percentage of the total population 65 years of age and older
4. Black population as a percentage of the total population
5. Percentage of all persons 25 years old and over who are high school graduates
6. Median family income
7. Interrelationship of family income and educational attainment
8. Percentage of the total labor force employed in blue collar occupations
9. Median housing value
10. Median contract rent
11. Percentage of all housing units which are owner occupied
12. Percentage of all occupied units constructed from 1960 to March 1970

Order forms for maps in the GE-50, GE-70, and GE-80 series are available upon request from the Subscriber Services Section, Bureau of the Census, Washington, D.C. 20233.

Graphic summaries from the 1970 census were published as parts of the U.S. Summary volumes PC(1)-1 and HC(1)-1 and reprinted as two supplementary reports PC(SI)-55 and HC(SI)-16. Included were several choropleth maps showing data by county across the United States, several maps showing data by State, a dot distribution map, and a number of charts and graphs.

The **Graphic Summary** from the 1969 Census of Agriculture contains 65 county choropleth maps and 230 dot maps showing the distribution of agricultural resources, products, and practices within the United States. The maps are shown at small scale, one or two to an 8½ by 11 inch page. Subjects include the number, sizes, types, and value of United States farms, the amount of land in farms and how that land is used, production of livestock, poultry and crops, hired farm labor, and machinery and equipment in use on farms. A more extensive **Graphic Summary** is being published from the 1974 Census of Agriculture.

The **Graphic Summary** from the 1972 Census of Governments presents charts, graphs, and maps showing data on government organization, public employment, and government finances. The nine maps portray these data by State.

GEOGRAPHIC CODE SCHEMES AND REFERENCE FILES

Geographic Code Schemes

Geographic areas are identified on most census computer tapes only by their numeric codes—names are not used. Users, therefore, require some form of a geographic code scheme to relate the codes for geographic areas to geographic area names. Codes

and the corresponding names for census geographic areas are contained in the following Census Bureau products: the Geographic Identification Code Scheme (GICS), the Master Enumeration District List (MEDList), the City Reference File (CRF), and Place Identification, Characteristics and Area, Distance and Direction (PICADAD).

Geographic Identification Code Scheme.—The Geographic Identification Code Scheme (GICS) is a four-volume set of tables which presents the names of political and statistical subdivisions (and their corresponding geographic codes) for which the Census Bureau tabulated data from the 1970 census. Geographic codes contained in the GICS correspond to those on all 1970 census computer tape products. Unlike the MEDList described below, the GICS does not present population or housing counts and does not include census tracts, enumeration districts, or block groups.

The GICS is presented in four publications, one for each census region: Northeast, $1.00; North Central, $1.75; South, $1.50; and West, $0.60. Together they are designated PHC(R)–3. Each volume contains three tables. Table 1, arranged by counties within State, shows the following codes, as appropriate, for counties, county subdivisions, and places: State, county, SMSA, MCD or CCD, place, place description, and place size. Figure 11 illustrates the hierarchical arrangement of geographic identifiers in Table 1 of the GICS. Table 2 presents alphabetically all the places within the State with their corresponding county, county subdivision, and place codes. A third table, shown once for each volume, presents SMSA and urbanized area codes for the entire United States.

Figure 11. **Illustration of the 1970 Geographic Identification Code Scheme (GICS) Table**

TABLE 1. COUNTIES, COUNTY SUBDIVISIONS AND PLACES

GEOGRAPHIC CODES									NAME
STATE	COUNTY	SMSA	ESR	SEA	MCD	PLACE	PLACE DESC	PLACE SIZE	
49	001		113	03					BEAVER
49	001		113	03	005				BEAVER DIV
49	001		113	03	005	0050	4	03	BEAVER
49	001		113	03	010				MILFORD-MINERSVILLE DIV
49	001		113	03	010	0590	4	03	MILFORD
49	001		113	03	010	0600	4	01	MINERSVILLE
49	003		112	01					BOX ELDER
49	003		112	01	005				BEAR RIVER DIV
49	003		112	01	005	0045	4	01	BEAR RIVER
49	003		112	01	005	0160	4	01	CORINNE
49	003		112	01	005	0210	4	01	ELWOOD
49	003		112	01	005	0260	4	01	FIELDING
49	003		112	01	005	0295	4	03	GARLAND
49	003		112	01	005	1005	4	06	TREMONTON
49	003		112	01	010				BENCHLAND DIV
49	003		112	01	010	0175	4	01	DEWEYVILLE
49	003		112	01	010	0375	4	02	HONEYVILLE
49	003		112	01	015				BRIGHAM CITY DIV
49	003		112	01	015	0080	4	08	BRIGHAM CITY

MEDList.—The Master Enumeration District List (MEDList) serves four purposes: (1) to link State, county, place, and minor civil division or census county division names with their corresponding codes; (2) to indicate the hierarchical relationships among those units; (3) to list the enumeration districts and block groups which make up these units; and (4) to provide population and housing counts for each of those units from the State level to the ED/BG level. (The population and housing counts contained on the MEDList do not reflect any of the corrections stated in correction notes to the PC(1) or HC(1) reports). An illustrative printout of the MEDList (from microfilm) is presented in figure 12.

Figure 12. **Master Enumeration District List (MEDList)**

Michigan — Frame No. 001 0

State						Place						Univ. area						Area name	Tract			ED				1970 counts	
1970	1960	Fed. Std. County	County of tab.	CCC	MCD/CCD	Code	Desc.	Size	SCA	SMSA	Urbanized area	Tracted area	Prefix	Code	SEA	ESR	CBD		Basic	Suffix	Blk. grp.	Code	Suffix	Urb./rural	Ward	Cong. dist.	Housing	Pop.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)
26	34	121		1														MUSKEGON									49831	149493
26	34	121		1	090													Ravenna TWP									650	2102
26	34	121		1	090	2275	4	02		5320		5320	1	34062	06	050	1	Ravenna Village	0029			0442		1		09	250	801
26	34	121		1	090		7			5320		5320	1	34062	06	050	1	Remainder of MCD (or CCD)	0029			0443		1		09	400	1301
26	34	121		1	095													Roosevelt Park City									633	2578
26	34	121		1	095	2345	4	06		5320	5320	5320	1	34062	06	050		Roosevelt Park City									633	2578
																	1		0022		1			0		09	200	885
																	1				2			0		09	312	1175
																	1				3			0		09	121	518
26	34	121		1	110		7			5320		5320	1	34062	06	050		White Hall TWP									581	1930
																	1		0030			0404		1		09	30	90
																	1		0036			0405		1		09	40	125
																	1		0037			0406		1		09	72	150
																	1		0038			0407		1		09	60	130
																	1		0040		1			0		09	165	625
																	1				2			0		09	214	810

Note: Explanation of column heading abbreviations: Federal Standard County; County of Tabulation; Central County Code (CCC); Minor Civil Division (MCD)/Census County Division (CCD); Place Description; Standard Consolidated Area (SCA); Standard Metropolitan Statistical Area (SMSA); Universal Area Code; State Economic Area (SEA); Economic Sub-Region (ESR); Central Business District (CBD); Block Group; Enumeration District (ED); Urban/Rural; Congressional District.

A second version of the MEDList, called the Master Enumeration District List With Coordinates, contains the latitude and longitude coordinates for population centroids (center points) for each of the approximately 250,000 enumeration districts and block groups. The geographic locations of the centroids were estimated visually from census maps based on the density of street patterns. Coordinate values were then assigned by an electronic digitizer.

City Reference File.—The City Reference File (CRF) is a computerized listing of census places and post office names and their associated ZIP, State, county, and place codes. It also contains common spelling variations of place and post office names and, where applicable, identifiers for SMSA's. The CRF was used by the Census Bureau for assigning geographic classification codes (State, county, place) to mailing addresses based on ZIP Codes and post office names. The CRF was constructed over a span of several years and was tailored to meet the geographic requirements for tabulating 1972 Economic Censuses data. An example of the file sequence of CRF is shown in figure 13.

While the CRF provides the capability to assign and edit geographic identifiers at the place level, its use without benefit of additional reference file input (such as street names and address ranges within city limits) may result in errors in some place code assignments. Use of the CRF can be limited because there is not always a direct relationship between ZIP Code service areas and census geography, even at the place and county level. Another limitation of the CRF is that while it contains all census places, it does not list all postal service places.

PICADAD.—Place Identification, Characteristics and Area, Distance And Direction (PICADAD) is a computerized list of place names and their associated geographic codes and geographic coordinates. It permits matching of post office names to geographic coordinates, thereby providing the capability to calculate distances between places. It can be used in analyses and tabulations concerning movements or relationships between virtually any geographic locations in the United States.

The PICADAD file contains approximately 24,000 unique geographic locations, each of which is associated with its common alternate names and variant spellings. Each location is assigned a unique "keypoint" number and is listed with its political and postal geography, various economic region identifiers, and its location coordinates.

Other Geographic Reference Files

The Census Bureau has developed three geographic reference files for use in various types of spatial analysis and computer mapping: DIMECO, the Area Measurement File, and the SMSA Tract Boundary Files.

DIMECO.—DIMECO is a boundary file for counties as defined in 1960 for the 48 conterminous States. The DIMECO file is in a format where each record represents a county boundary segment. The principal use of DIMECO is for computer mapping, but since it is in a segment format, many other applications (such as area and distance measurement) are possible. The coordinates are supplied in two forms for convenience—geodetic coordinates (latitude/longitude) for general use, and Alber's equal-area projection for thematic mapping. Areas and distances can also be accurately calculated from DIMECO.

Area Measurement File.—This file was prepared by computing the center of population for each county from the 1970 population centroids of enumeration districts and block groups as shown on the MEDList. The county center value is given in decimal degrees of latitude/longitude. Total land and water area for each county is also included. The concept of the

Figure 13. **Example of the City Reference File Showing File Sequence**

ZIP	PLACE, COUNTY, PO NAME	PNS	PI	NS	COUNTY NAME	ST	CO	PLACE	PD	PS	SMSA	SERIAL NO. WITH CHECK DIGIT
20012	TAKOMA PK			3	PRINCE GEORGES	24	033	0950	4	4	8840	000918102
20012	WASHINGTON			3	PRINCE GEORGES	24	033	0950	4	4	8840	000918201
20022	CAMP SPRINGS			1	PRINCE GEORGES	24	033	0122	9		8840	000918300
20022	CAMP SPRING			3	PRINCE GEORGES	24	033	0122	9		8840	000918409
20022	WASHINGTON			3	PRINCE GEORGES	24	033	0122	9		8840	000818508
20022	OXON HILL			1	PRINCE GEORGES	24	033	0747	9		8840	000918607
20022	WASHINGTON			3	PRINCE GEORGES	24	033	0747	9		8840	000918805
20022	PRINCE GEORGES CO.			1	PRINCE GEORGES	24	033	9990	9		8840	000918904
20022	WASHINGTON			3	PRINCE GEORGES	24	033	9990	9		8840	000919001
20836	CALVERT CO.			1	CALVERT	24	009	9990	9			000919100
20836	LOWER MARLBORO			3	CALVERT	24	009	9990	9			000919209
20836	OWINGS			3	CALVERT	24	009	9990	9			000919308

NOTE: PNS = Place Name Status; PI = Part Indicator; NS = Name Status; ST = State Code; CO = County Code; PD = Place Description Code; PS = Place Size Code.

center of population as traditionally used by the Census Bureau is that of a balance point, that is, the point at which an imaginary, flat, weightless, and rigid plane representation of an area would balance if weights of identical size were placed on it so that each weight represented the location of one person on April 1, 1970.

SMSA Tract Boundary Files.—These files contain latitude/longitude coordinates for the boundaries of all census tracts within SMSA's as defined in 1970. The tract boundary files were originally produced for the Census Bureau's **Urban Atlases.** The tract boundary outlines, a data file of selected population and housing statistics, and the listing of a FORTRAN program used to generate SYMAP-compatible input are available for over 200 SMSA's. The tract boundary files can be used for computer mapping and other types of spatial analysis.

Acquisition

Copies of the Geographic Identification Code Schemes can be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The MEDList with coordinates, City Reference File, PICADAD, DIMECO, and the Area Measurement File are each available on computer tape for $80 each. The SMSA Tract Boundary Files are available (on 2 tapes) for $160. The MEDList (without coordinates) is available on microfilm for $8.00 per reel (3 reels), also from the Customer Services Branch. All can be obtained from the Customer Services Branch, Data User Services Division, Bureau of the Census, Washington, D.C. 20233. Phone (301) 763-2400.

Order forms for these publication series are available from Subscriber Services Section, Bureau of the Census, Washington, D.C. 20233.

The **1970 Census Users' Guide** is a two-part general reference manual. Part I contains information on census content, data products (now somewhat dated), geographic materials, and uses, as well as a dictionary of census terms including a section on geographic terms. Part II contains technical documentation for the First, Second, Third and Fourth Count summary tapes. The **1970 Census Users' Guide** can be purchased from the Census Bureau, Subscriber Services Section at the following prices: Part I, $2.10; Part II, $4.40.

Another source for information about geographic concepts is the **Reference Manual on Population and Housing Statistics from the Census Bureau.** This manual is designed to provide a comprehensive introduction to the 1970 census and related current programs. It includes a chapter on geographic concepts, including user notes, and discussions of hierarchical relationships and changes to area definitions over time. The **Reference Manual** can be purchased for $2.00 from the Subscriber Services Section, Bureau of the Census, Washington, D.C. 20233.

The monthly newsletter, **Data User News**, highlights Census Bureau activities, products, and services. It provides information on new publications, the release of data in both printed reports and summary tapes, upcoming surveys and censuses, developments in census geography including revisions for the 1980 census, and local applications of census data. **Data User News** is available by subscription for $4.00 a year from the Subscriber Services Section, Bureau of the Census, Washington, D.C. 20233.

GEOGRAPHY REFERENCE REPORTS

Boundary and Annexation Survey, 1970-1975 features statistics on boundary changes since January 1970 for incorporated places with populations of 2,500 or more. The report also contains the names of all places which have incorporated, consolidated, or disincorporated since 1970.

On January 1, 1971, the Bureau of the Census conducted the first of its Boundary and Annexation Surveys. Surveys have been made annually on each subsequent January 1. This publication includes detailed boundary change information for each of 6 calendar years (1970 through 1975) as well as summary tables for the 6-year period.

Centers of Population for States and Counties explains how center of population locations were established by the Census Bureau. A general summary of statistics and their relationship with one another for the years 1950, 1960, and 1970 is included. Contents of the report include a table of locations and descriptions of centers of State population for 1950, 1960, and 1970; tables showing county centers of population for 1970; and 51 maps showing centers of State population.

Census Tract Memorandum No. 17 lists SMSA's as defined April 15, 1974, the counties that make up each, any other counties containing census tracts, and the number of census tracts recognized in each county for the 1970 and 1960 censuses.

The GE-41 series, **Small Area Statistics Papers**, are reprints of papers presented at the Conferences on Small-Area Statistics from the American Statistical Association and cover the broad area of the use of all types of small-area data including intercensal estimates, revenue sharing, and social indicators.

Another series of publications, the GE-60 Series, **Computerized Geographic Coding**, presents the proceedings of regional conferences which were devoted to local applications of GBF/DIME-Files (discussed below). This series provides insight as to what local agencies are doing or plan to do with their GBF/DIME-Files.

THE GBF/DIME SYSTEM

Address Coding Guides

In conducting the 1970 census, two different enumeration methods were used: the mail-out/mail-back type of canvass, applied primarily in large urban areas, and the conventional house-to-house visits by enumerators in the remainder of the country. The mail-out/mail-back procedure was used in 145 of the then 233 SMSA's and in certain adjoining areas. Approximately 60 percent of the population was canvassed by mail rather than by an enumerator's visit. Householders were asked to complete the census questionnaires in the privacy of their own homes and mail them back to a local Census Bureau office. The remainder of the country was enumerated by the

conventional house-to-house canvassing procedure which closely resembled enumeration methods of the 1960 and earlier censuses. Census takers visited each housing unit and obtained the information required on the questionnaire. Appropriate geographic codes for each household were assigned to the questionnaires by the enumerator.

In the 145 SMSA's in which the mail-out/mail-back technique was used, a method of assigning specific census geographic codes to each mailing list address was needed. A master computer file was created, called an Address Coding Guide (ACG), which contained the information necessary to geographically code the residential addresses for each area. The ACG performed one of the functions of an enumerator by providing the census geography for each residential address.

ACG's are computerized lists of street names and address ranges for all streets within the city postal delivery area (which roughly corresponds to the urbanized area) of an SMSA. Features such as municipal boundaries, rivers, and railroad tracks are not included since there are no housing addresses associated with them. ACG's are no longer maintained by the Census Bureau, having been replaced by GBF/DIME-Files.

GBF/DIME-Files

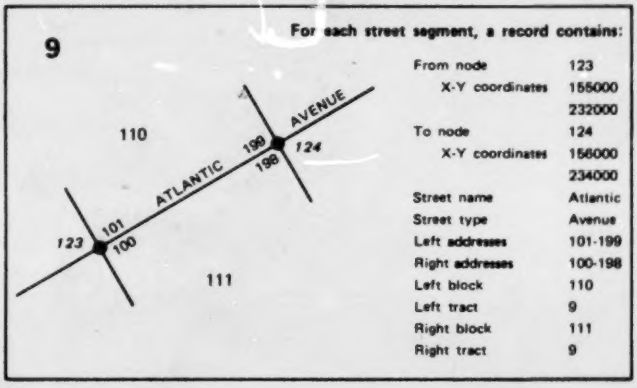
After preparation of the ACG's was well underway (and the 1970 census date was too near to permit a change in the system), an improved version of the ACG was developed. The improved ACG, which was known as a geographic base file (GBF), was developed using a technique called Dual Independent Map Encoding (DIME). The geographic base file, now commonly referred to as the GBF/DIME-File, is characterized by: (1) an editing capability which improves the accuracy of the files and, (2) added features which increase the utility to local users.

The concept underlying the creation of the GBF/DIME-Files is derived from graph theory. Each street, river, railroad track, municipal boundary, and other feature that bounds a census block can be considered as one or more straight line segments; curved streets or other features can be divided into series of straight line segments. Where streets or other features intersect or change direction, node points are identified. While an ACG was constructed on a block face basis, a GBF/DIME-File is constructed on a street segment basis. Therefore, while each ACG record contains the appropriate census geographic codes for one side of a street between two intersections, each GBF/DIME-File segment record contains the appropriate codes for both sides of a street between two nodes. By uniquely identifying each segment (including segments that are not along streets) and each node point, and their hierarchical geographic relationships, a geographic description which can be checked by computer for accuracy is made possible.

The construction of a GBF/DIME-File involves the transcription of geographic information (i.e., street patterns, address ranges, area identifiers) from metropolitan maps and other sources into a form that can be read and manipulated by computer. Clerks enter the various types of geographic information on worksheets which are then keypunched and entered into the computer. After the computer editing, appropriate correction, and insertion of coordinates, the GBF/DIME-File is ready for use.

Essentially the same basic information is contained in both the ACG and GBF/DIME-Files: street name, address ranges, census tract and block numbers, place codes, ZIP Codes, and other geographic areas. However, the GBF/DIME-File has three additional codes: (1) the left-right orientation code separating the census geographic codes for areas on each side of the street segment; (2) the identification number of the node point at each end of the segment; and (3) the x-y coordinates of each node point expressed in State plane coordinates (measured in feet relative to State plane grid systems), latitude and longitude (measured in degrees based on distance from the equator), and map set miles (measured in miles from an arbitrary point at the southwest corner of the MMS sheet). Figure 14 illustrates in general terms how a GBF/DIME-File record relates to the features on a map. As with ACG's, most GBF/DIME-Files cover only the urbanized area of an SMSA. Appendix C lists the areas for which GBF/DIME-Files are available.

Figure 14. **Contents of a GBF/DIME-File Record**



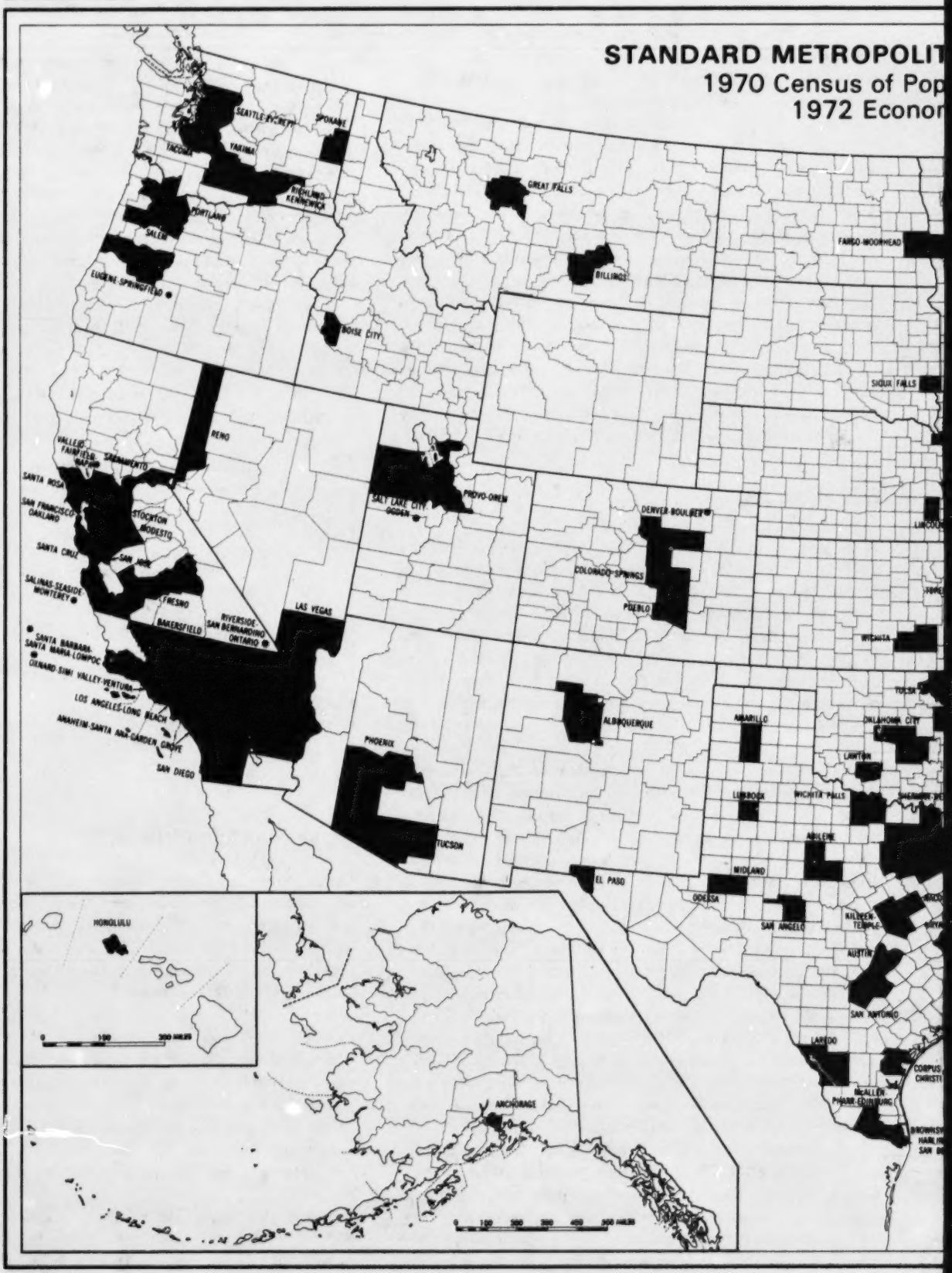
Census Tract Street Indexes

Census tract street indexes are listings of street names and their address ranges for census tracts within urbanized areas of SMSA's. The extent of coverage is limited to the postal city delivery area of the SMSA. Outside of that area the only recourse in identifying addresses to census tracts is to use maps in the PHC(1) **Census Tracts** reports, which do not contain address ranges.

Each census tract index identifies streets by prefix direction (north, south, etc.), street name, suffix direction (north, south, etc.), and street type (street, avenue, court, etc.). The index shows the high and low ends of the address range of streets passing through a specified census tract. The street identification is repeated each time the street in question passes through a new tract and the address range in that tract is indicated as well.

Street indexes are available for the urbanized areas of most SMSA's in the United States and can be developed for any 1970 SMSA upon request. These indexes are prepared from

UNITED STATES
DEPARTMENT OF COMMERCE



BUREAU OF THE CENSUS
GEOGRAPHY DIVISION

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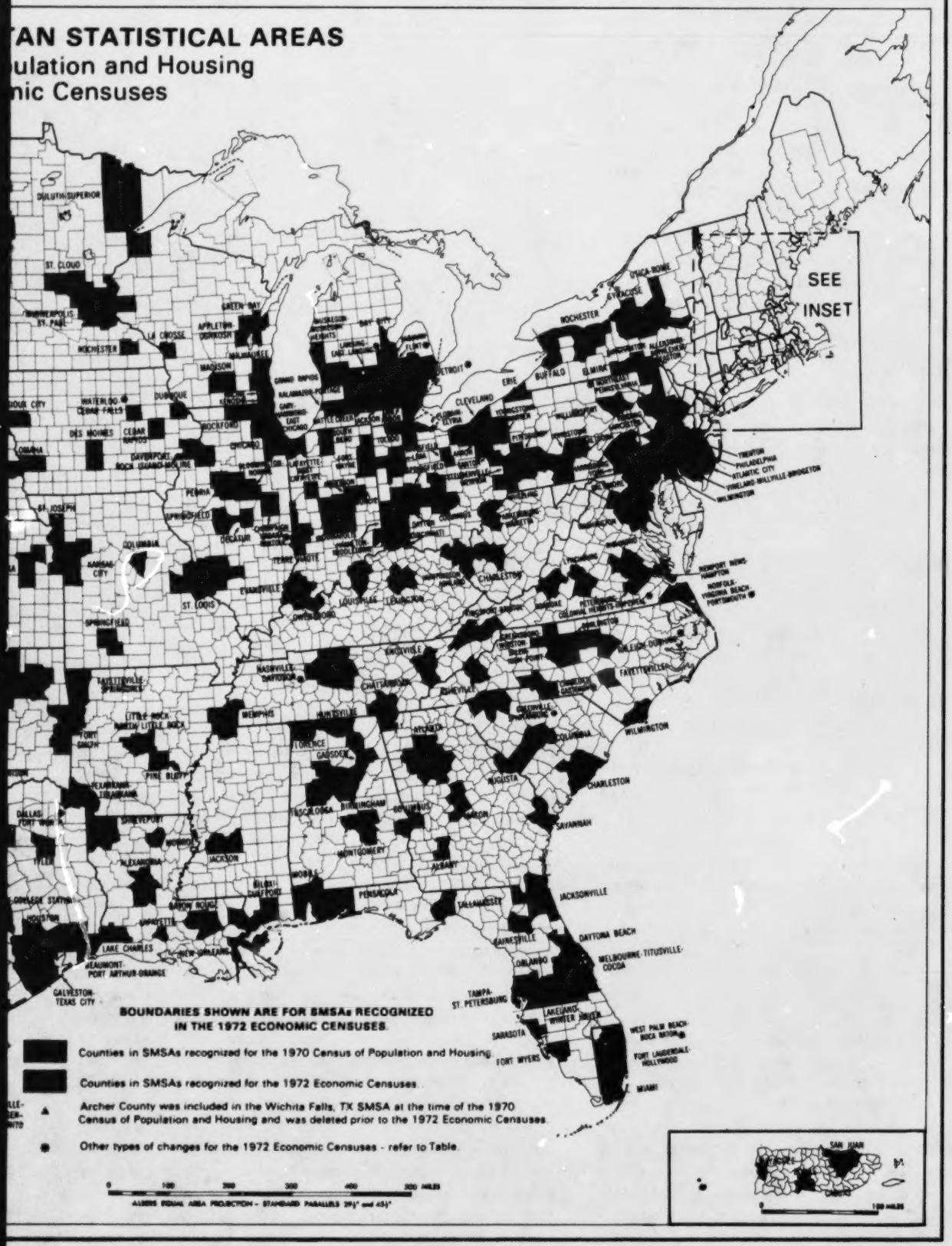


BOUNDARIES SHOWN ARE FOR SMSAs RECOGNIZED IN THE 1972 ECONOMIC CENSUSES.

Counties in SMSAs recognized for the 1970 Census of Population and Housing.

Counties in SMSAs recognized for the 1972 Economic Censuses.

▲ Archer County was included in the Wichita Falls, TX SMSA at the time of the 1970 Census of Population and Housing and was deleted prior to the 1972 Economic Censuses.

● Other types of changes for the 1972 Economic Censuses - refer to Table.

the most current GBF/DIME-Files for the urbanized areas of SMSA's for which a GBF/DIME-File exists. In SMSA's for which GBF/DIME-Files do not exist, ACG files are used to prepare the indexes. While some geographic base files are more current, the ACG's and most GBF/DIME-Files reflect street names and address ranges as they existed between 1968 and 1970 when the original ACG's were developed.

Census tract street indexes are available at a cost of $80 per urbanized area with the following exceptions: Washington, D.C., Miami, Tampa, St. Petersburg, Baltimore, Boston, Minneapolis-St. Paul, Kansas City, St. Louis, Cleveland, Portland, Pittsburgh, Dallas, Houston, and Seattle at $160 each, Los Angeles, San Francisco, Chicago, Detroit, and Philadelphia at $240 each. New York is not available. Inquiries concerning the indexes should be directed to Customer Services Branch, Data User Services Division, Bureau of the Census, Washington, D.C. 20233.

The CUE Program

As with most large-scale computer products, GBF/DIME-Files have some errors and, like the associated source MMS sheets from which they were constructed, the files become out of date as time passes. The files and appropriate maps must be updated as well as corrected to be of most use to local agencies and the Census Bureau. To accomplish this, the Census Bureau has established the CUE Program, referring to the correction, update, and extension of GBF/DIME-Files.

Purposes of the CUE Program are:

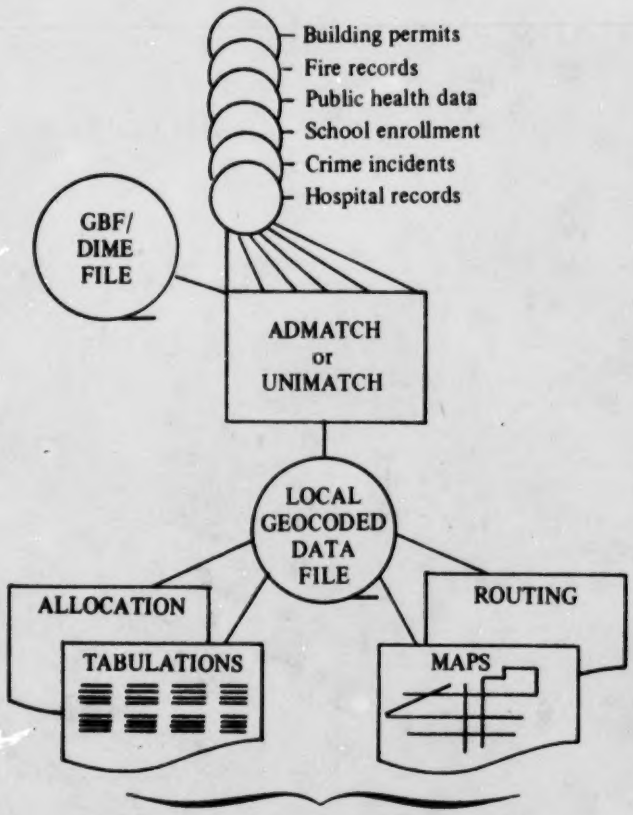
1. To make corrections as necessary to produce a complete and accurate GBF/DIME-File and MMS sheets for SMSA's having an existing file.
2. To prepare GBF/DIME-Files and MMS sheets for those SMSA's where GBF/DIME-Files and MMS sheets do not currently exist.
3. To develop procedures by which SMSA's can systematically maintain current and accurate GBF/DIME-Files and MMS sheets.

Through the CUE Program, many local agencies are correcting, updating, and extending their GBF/DIME-Files using computer programs and clerical procedures developed by the Census Bureau. Further information on the CUE Program can be obtained from the Geography Division, Bureau of the Census, Washington, D.C. 20233.

GBF/DIME Applications

GBF/DIME-Files, along with related computer programs such as those mentioned below, can be used to assign geographic codes carried on those files to any records containing local street addresses. After local records (such as school enrollment or charge accounts) have been geocoded, they can be tallied for analysis, along with census statistics or other local data for the area. The generalized flowchart in figure 15 shows how a GBF/DIME-File can be used to assign geographic codes to individual records allowing them to be summarized by geography and then displayed or analyzed in some way.

Figure 15. **GBF/DIME System**



Since a GBF/DIME-File associates coordinates with computerized geographic records, it provides an essential input for computer mapping. A GBF/DIME-File can be used in street network analysis and routing design problems. Street networks of varying degrees of detail are required for computerized study and design of routes for garbage trucks, ambulances, and other service vehicles. Computer programs that are designed to allocate resources to facilities can also take advantage of a GBF/DIME-File. For example, the file can be used in allocating people to community fallout shelters, determining logical service areas for community health facilities, or children to schools, and evaluating alternate sites for new retail outlets.

Many organizations now use GBF/DIME-Files as analytic tools. For example, a city's parks and recreation department wishes to know how many children in the local school system live in each planning district and their distribution within that district to determine where new playgrounds should be built; the executives of a department store want to know which census tracts their charge account customers live in, as part of the planning for new branch stores. GBF/DIME-Files, along with related computer programs such as those mentioned below, can be used to assign geographic codes carried on those files to any records containing local street addresses. After the organization's records (such as school enrollment or charge

accounts) have been so coded, they can be tallied for analysis, along with census statistics or other local data for the area.

GBF/DIME Computer Software

A large number of computer programs that can be used with a GBF/DIME-File have been written at the Census Bureau. They can be used for a number of different applications such as geocoding, computer mapping, and file manipulation. These programs are categorized in figure 16 and explained in detail in appendix E.

Figure 16. **GBF/DIME Software**

CORRECTION, UPDATE & EXTENSION[1]
- CREATE
- ADDEDIT-L
- TOPOEDIT
- FIXDIME II
- FIXCORD
- NODEDIT
- FIXDIME 3

FILE PREPARATION[2]
- DACS
- POLYGON
- GBF/POLYGUIDE
- INTERSECT
- SECS
- STREETS

GEOCODING[2]
- ADMATCH
- UNIMATCH/ZIPSTAN

COMPUTER MAPPING[2]
- GRIDS
- EASYMAP
- CENPLOT

RESOURCE ALLOCATION[2]
- CARPOL

[1] CUE tape (one reel of tape containing 7 programs and documentation - $80).
[2] GBF/DIME application tape (one reel of tape containing 10 programs and documentation - $80).

All are available from:

Customer Services Branch
Data User Services Division
U.S. Bureau of the Census
Washington, D.C. 20233

Telephone: (301) 763-2400

Correction, Update and Extension.—The CREATE program and related clerical procedures provide a local agency with a standardized system for creating a new GBF/DIME-File or for extending the coverage of an already existing file. Several COBOL edit and correction programs are also available. These include an address range, node chain and ZIP Code edit program, ADDEDIT-L; a block edit program, TOPOEDIT; file correction programs, FIXDIME II and FIXDIME 3; a program for editing the nodes in a file, NODEDIT; and a program for inserting coordinate values, FIXCORD.

File Preparation.—These programs are used to edit, reformat, or manipulate GBF/DIME-Files. This software includes a program for calculating areas and computing centroids of various areas, DACS; a program for determining segment intersections, SECS; a program for producing street and address listings from the file, STREETS; a program for determining the address range of a segment within specified boundaries, GBF/POLYGUIDE; a series of programs for restructuring a GBF/DIME-File into a file of geographically coded intersections, INTERSECT; and a program for defining additional local geography (i.e., school districts, precincts) on the file, POLYGON.

Geocoding.—ADMATCH is an address matching system which provides the capability of geocoding computer-readable records containing street addresses. It is designed to attach geographic codes (such as census tract, block, school district, geographic coordinates, etc.) to records containing street addresses. UNIMATCH is a generalized record linkage system designed to assign geographic codes or to match data files. ZIPSTAN is a computer program which can be used as an address standardizer for UNIMATCH processing. ZIPSTAN converts addresses into a standard form (i.e., corrects misspelled street components, converts nonstandard abbreviations into a standard form) suitable for input to UNIMATCH.

Computer Mapping.—GRIDS is a generalized computer graphics system which produces several types of line printer maps using a large variety of files. EASYMAP is a computer program designed as an inexpensive and simple means of producing line printer choropleth (shaded area) maps from a basic boundary file. These maps can optionally have boundaries around each data area, map borders, margins and headings. CENPLOT is a program designed to plot segment records in the GBF/DIME-File. A CALCOMP or similar plotter is required.

Resource Allocation.—CARPOL is a computer program which develops lists of potential carpoolers who live near each other and who work similar hours.

ACQUIRING GEOGRAPHIC PRODUCTS

All geographic products contained on computer tape sell for $80 per reel. This price includes the cost of reproducing copies, plus the cost of the tape reels, technical documentation, and shipping and handling. Computer tapes can be purchased from:

Customer Services Branch
Data User Services Division
Bureau of the Census
Washington, D.C. 20233

Phone: (301) 763-2400

FURTHER INFORMATION

If further information is desired concerning the matters presented in this DAD, address inquiries to:

Data Access and Use Staff
Data User Services Division
Bureau of the Census
Washington, D.C. 20233

Phone: (301) 763-2400

Appendix A

1970 CENSUS GEOGRAPHY

Geographic Areas Associated with the 1970 Census of Population and Housing

Regions.—Regions are large, geographically contiguous groups of States (with the exception of the region which includes Alaska and Hawaii) which are the first-order census subdivisions of the United States. There are four regions: Northeast, North Central, South, and West. See figure A-1.

Divisions.—Divisions are groups of States which are subdivisions of regions. There are nine geographic divisions. They have remained largely unchanged and have been used for the presentation of summary statistics since the 1910 census. See figure A-1.

States.—The 50 States are the major political units of the United States. The District of Columbia is treated as a State-equivalent in all tabulation series. See figure A-1.

Counties.—Counties are the primary political and administrative divisions of the States. In Louisiana such divisions are called parishes, and in Alaska 29 census divisions were established as county equivalents for statistical purposes. A number of cities (Baltimore, MD; St. Louis, MO; Carson City, NV; and a number of Virginia cities) are independent of any county organization and thereby constitute primary divisions of their States and are treated the same as counties in census tabulations. There were 3,141 counties and county equivalents in the United States tabulated for the 1970 census.

Figure A-1. **Geographic Regions and Divisions of the United States**

Minor Civil Divisions (MCD's).—These are the primary political and administrative subdivisions of counties; most frequently known as townships, but in some States include towns, precincts, and magisterial districts. MCD tabulations were made for the 1970 census in 29 States. In 1970, over 24,000 MCD's were recognized by the Census Bureau.

Census County Divisions (CCD's).—In 21 States, MCD's were found to be unsuitable for presenting statistics, either because the areas have lost their original significance, are very small in population, have frequent boundary changes, or have indefinite boundaries. The Census Bureau, in cooperation with State and local governments, established relatively permanent statistical areas designated as Census County Divisions.

CCD's are defined with boundaries that seldom change and can be easily located (e.g., roads, highways, streams, railroads, power lines, and bridges). Large incorporated places are usually recognized as separate CCD's even though their boundaries may change as a result of annexations. Cities with 10,000 or more inhabitants generally are separate CCD's and some incorporated places with as few as 1,000 population may be separate CCD's in very rural areas. There were approximately 7,000 CCD's in the 1970 census. The 21 States with CCD's in 1970 were Alabama, Arizona, California, Colorado, Delaware, Florida, Georgia, Hawaii, Idaho, Kentucky, Montana, New Mexico, North Dakota, Oklahoma, Oregon, South Carolina, Tennessee, Texas, Utah, Washington, and Wyoming.

Places.—The term "place," as used by the Census Bureau, refers to a concentration of population, regardless of the existence of legally prescribed limits, powers, or functions. Most of the places identified in the 1970 census are incorporated as cities, towns, villages, or boroughs. In addition, a number of unincorporated places were delineated for the 1970 census tabulations. There were almost 21,000 places recorded in the 1970 census.

1. **Incorporated places.**—These are political units incorporated as cities, boroughs (excluding Alaska and New York), villages and towns (excluding the New England States, New York, and Wisconsin). Most incorporated places are subdivisions of the MCD or CCD in which they are located; for example, a village located within and legally part of a township. However, almost 4,000 incorporated places cross MCD and/or county lines, but no incorporated places cross State lines since they are chartered under the laws of a State. There were over 18,500 incorporated places in 1970.

2. **Unincorporated places.**—These are densely settled population centers without legally defined corporate limits or any other corporate powers or function. Each has a definite residential nucleus. Boundaries are drawn by the Census Bureau, in cooperation with State and local agencies, to include, insofar as possible, all the closely settled areas. In the 1970 census, statistics were tabulated for each unincorporated place with 5,000 inhabitants or more if located inside an urbanized area, or with 1,000 inhabitants or more if located outside any urbanized area. In all, 2,100 unincorporated places were recognized in the 1970 census.

For the 1980 census, the term unincorporated place is being changed to census designated place (CDP). The new terminology is designed to make it more explicit that unincorporated places are defined by the Census Bureau, and to avoid confusion in New England where many unincorporated places are parts of incorporated towns. For the 1980 census, CDP's will be used to describe densely settled population centers without legally defined limits or corporate powers. CDP's, as did unincorporated places, contain a dense, city-type street pattern and ideally should have an overall population density of at least 1,000 persons per square mile. In addition, a CDP should be a community that can be identified locally by place name, having developed over the years from a small commercial area or market center, rather than encompassing a residential land subdivision, apartment development, or general urban expansion area.

Standard Metropolitan Statistical Areas (SMSA's).—An SMSA is an integrated economic and social unit with a recognized large population nucleus. Generally, each SMSA consists of one or more entire counties, or county equivalents, that meet standards pertaining to population and metropolitan character. In New England, towns and cities, rather than counties, are used as the basic geographic units for defining SMSA's. In Alaska, census divisions are used for defining SMSA's.

SMSA's are designated by the Office of Federal Statistical Policy and Standards of the Department of Commerce with the advice of the Federal Committee on Standard Metropolitan Statistical Areas, which is composed of representatives of concerned Federal agencies. From time to time, the criteria for defining SMSA's are reviewed and revised; as a result, new SMSA's are established, and new areas are added to existing SMSA's.

Criteria used to establish the 247 SMSA's for which data were tabulated for the 1970 census specified that an SMSA include at least:

1. One city with 50,000 inhabitants, or more, or
2. Two cities having contiguous boundaries and constituting, for general economic and social purposes, a single community with a combined population of at least 50,000, the larger of which had a population of at least 35,000.

Criteria used to delineate the 267 SMSA's for which data were tabulated for the 1972 Economic Censuses specified that an SMSA include at least:

1. One city with 50,000 inhabitants, or more, or
2. A city having a population of at least 25,000 which, with the addition of the population of contiguous

places, incorporated or unincorporated, having a population density of at least 1,000 persons per square mile, which together must constitute, for general economic and social purposes, a single community with a combined population of at least 50,000, provided that the county or counties in which the city and contiguous places are located has a total population of at least 75,000.

Users of data for SMSA's need to pay attention to boundary changes that occur from time to time, particularly in comparing data from different sources. Of particular interest are the boundary changes that occurred between the reference dates for the 1970 Census of Population and Housing and the 1972 Economic Censuses: 23 new SMSA's were defined in the interim and 101 of the existing SMSA's changed boundaries. These boundary changes are highlighted in the centerfold map and figure A-2.

All of the changes could not adequately be represented on the maps, such as name changes and consolidations. SMSA changes between the 1970 and 1972 census, not obvious from the maps, are as follows:

Boston, Mass. SMSA. Billingham, Franklin, Stoughton, and Wrentham towns in Norfolk County, and Abington and Hanson towns in Plymouth County were transferred to Boston from other SMSA's. In addition, Boxford town in Essex County, Acton, Boxborough, Carlisle, and Holliston towns in Middlesex County, Foxborough and Medway town in Norfolk County, and Kingston town in Plymouth County were added.

Brockton, Mass. SMSA. Stoughton town in Norfolk County, Abington and Hanson towns in Plymouth County, deleted from area definition (transferred to Boston SMSA).

Champaign-Urbana-Rantoul, Ill. SMSA. Name changed from Champaign-Urbana, Ill. SMSA.

Charlotte-Gastonia, N.C. SMSA. Charlotte, N.C. SMSA (Mecklenburg County, Union County) combined with Gastonia, N.C. SMSA (Gaston County) to form Charlotte-Gastonia, N.C. SMSA.

Dallas-Fort Worth, Tex. SMSA. Dallas, Tex. SMSA (Collin County, Dallas County, Denton County, Ellis County, Kaufman County, Rockwall County), and Fort Worth, Tex. SMSA (Johnson County and Tarrant County) combined to form Dallas-Fort Worth, Tex. SMSA.

Denver-Boulder, Colo. SMSA. Denver, Colo. SMSA (Adams County, Arapahoe County, Denver County, Jefferson County) combined with Boulder, Colo. SMSA (Boulder County) to form Denver-Boulder, Colo. SMSA.

Detroit, Mich. SMSA. Lapeer County transferred to Detroit, Mich. SMSA from Flint, Mich. SMSA.

Eugene-Springfield, Ore. SMSA. Name changed from Eugene, Ore. SMSA.

Flint, Mich. SMSA. Lapeer County transferred from Flint, Mich. SMSA to Detroit, Mich. SMSA.

Greenville-Spartanburg, S.C. SMSA. Greenville, S.C. SMSA (Greenville County, Pickens County) combined with Spartanburg, S.C. SMSA (Spartanburg County) to form Greenville-Spartanburg, S.C. SMSA.

Kalamazoo-Portage, Mich. SMSA. Name changed from Kalamazoo, Mich. SMSA.

Lansing-East Lansing, Mich. SMSA. Name changed from Lansing, Mich. SMSA.

Nashville-Davidson, Tenn. SMSA. Nashville, Tenn. SMSA consolidated with Davidson County to form Nashville-Davidson, Tenn. SMSA.

Nassau-Suffolk, N.Y. SMSA. Nassau County and Suffolk County transferred from New York, N.Y. SMSA to form Nassau-Suffolk, N.Y. SMSA.

New Haven-West Haven, Conn. SMSA. Name changed from New Haven, Conn. SMSA.

New York, N.Y.-N.J. SMSA. Bergen County, N.J. transferred from Paterson-Clifton-Passaic, N.J. SMSA to New York SMSA. Nassau and Suffolk Counties taken from New York SMSA to form Nassau-Suffolk SMSA.

Norfolk-Virginia Beach-Portsmouth, Va. SMSA. Name changed from Norfolk-Portsmouth, Va. SMSA.

Northeast Pennsylvania SMSA. Scranton, Pa. SMSA (Lackawanna County), Wilkes-Barre-Hazleton, Pa. SMSA (Luzerne County) and Monroe County, Pa. combined to make Northeast Pennsylvania SMSA.

Oxnard-Simi Valley-Ventura, Calif. SMSA. Name changed from Oxnard-Ventura, Calif. SMSA.

Paterson-Clifton-Passaic, N.J. SMSA. Bergen County transferred from Paterson-Clifton-Passaic, N.J. SMSA and added to New York, N.Y. SMSA.

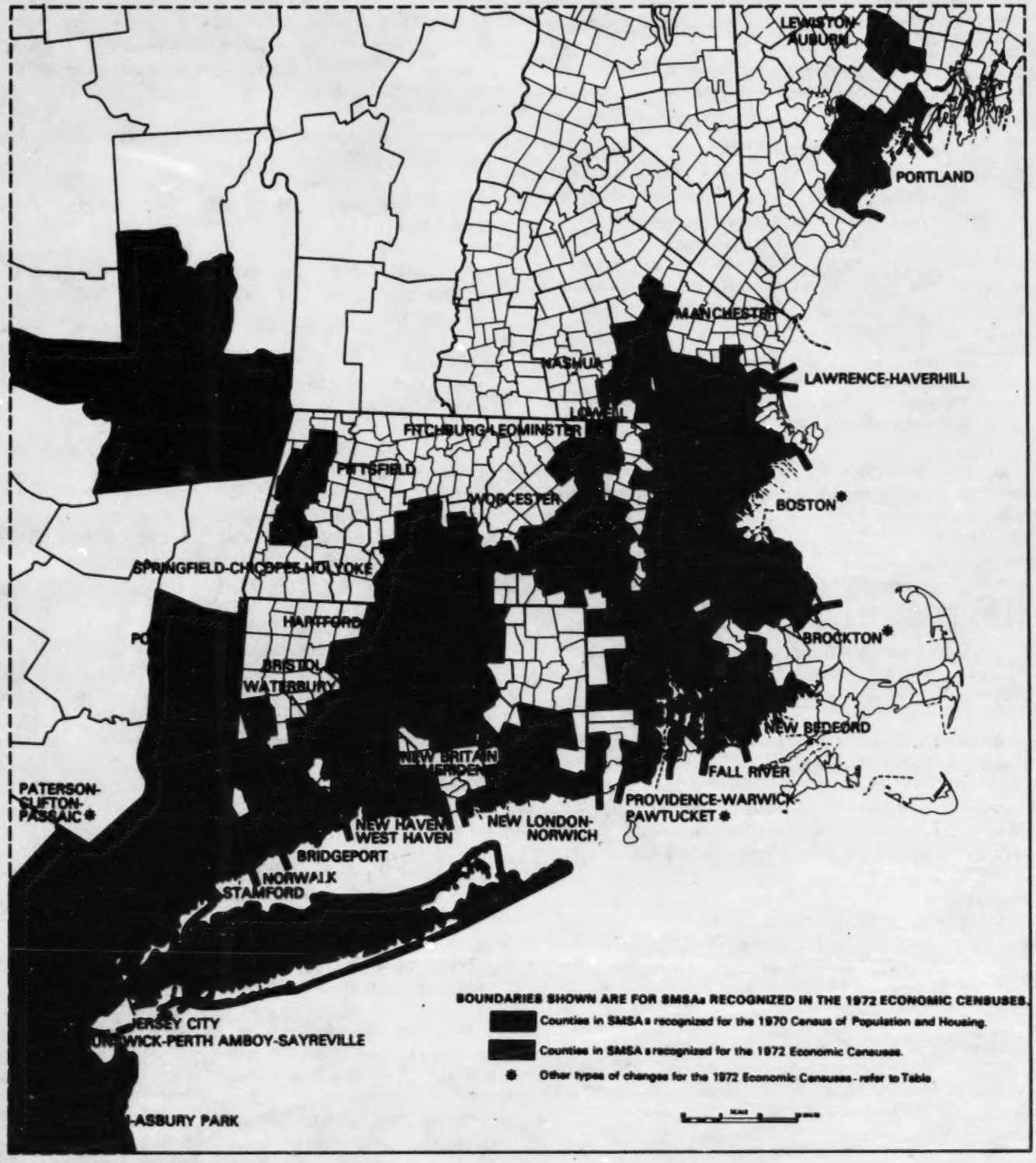
Petersburg-Colonial Heights-Hopewell, Va. SMSA. Name changed from Petersburg-Colonial Heights, Va. SMSA.

Providence-Warwick-Pawtucket, R.I.-Mass. SMSA. Bellingham, Franklin, and Wrentham towns in Norfolk County, Mass. deleted from area definition (transferred to Boston SMSA).

Raleigh-Durham, N.C. SMSA. Raleigh, N.C. SMSA (Wake County) combined with Durham, N.C. SMSA. (Durham County, Orange County) to form Raleigh-Durham, N.C. SMSA.

Riverside-San Bernardino-Ontario, Calif. SMSA. Name changed from San Bernardino-Riverside-Ontario, Calif. SMSA.

Figure A-2. **Inset from Centerfold Map**



Salinas-Seaside-Monterey, Calif. SMSA. Name changed from Salinas-Monterey, Calif. SMSA.

Salt Lake City-Ogden, Utah SMSA. Salt Lake City, Utah SMSA (Davis County, Salt Lake County) combined with Ogden, Utah SMSA (Weber County) to form Salt Lake City-Ogden, Utah SMSA.

Santa Barbara-Santa Maria-Lompoc, Calif. SMSA. Name changed from Santa Barbara, Calif. SMSA.

Texarkana, Texas-Texarkana, Arkansas SMSA. Name changed from Texarkana, Texas-Ark. SMSA.

Vallejo-Fairfield-Napa, Calif. SMSA. Name changed from Vallejo-Napa, Calif. SMSA.

Waterloo-Cedar Falls, Iowa SMSA. Name changed from Waterloo, Iowa SMSA.

West Palm Beach-Boca Raton, Fla. SMSA. Name changed from West Palm Beach, Fla. SMSA.

Wichita Falls, Tex. SMSA. Archer County was dropped from the Wichita Falls, Tex. SMSA.

SMSA's designated between the 1972 Economic Censuses and July 1, 1978 are as follows:

Anniston, Ala. SMSA. Calhoun County

Bloomington, Ind. SMSA. Monroe County

Bradenton, Fla. SMSA. Manatee County

Clarksville-Hopkinsville, Tenn.-Ky. SMSA. Montgomery County, Tenn. and Christian County, Ky.

Eau Claire, Wis. SMSA. Eau Claire and Chippewa Counties

Fort Collins, Colo. SMSA. Larimer County

Grand Forks, N.D.-Minn. SMSA. Grand Forks County, N.D. and Polk County, Minn.

Greeley, Colo. SMSA. Weld County

Kankakee, Ill. SMSA. Kankakee County

Kokomo, Ind. SMSA. Howard and Tipton Counties

Lawrence, Kans. SMSA. Douglas County

Longview, Tex. SMSA. Gregg and Harrison Counties

Panama City, Fla. SMSA. Bay County

Pascagoula-Moss Point, Miss. SMSA. Jackson County

SMSA changes since 1970 have occurred for three separate reasons:

1. Commuting data from the 1970 census showed that certain counties were sufficiently integrated with the existing SMSA that those counties qualified for inclusion in the SMSA. In a few cases that also involved the combination of existing entire SMSA's (e.g., Dallas-Forth Worth).
2. Definitional criteria were relaxed somewhat to allow SMSA designation for places as small as 25,000 population if—
   a. the city, and contiguous places with a population density of at least 1,000 persons per square mile constitute (for general economic and social purposes) a single community with a total population of at least 50,000, and
   b. the county or counties (towns in New England) in which the places are located have at least 75,000 inhabitants.
3. Some additional places have increased in size to meet the basic population criteria of 50,000 inhabitants or more, or the modified criteria given above either through annexations or population gains evidenced by special censuses or revenue sharing population estimates.

There are two basic types of changes—those that involve changes to existing SMSA's (type 1 above), and those that involve the creation of new SMSA's (types 2 and 3 above). There have been, as shown above, 14 new SMSA's designated since the reference date for the 1972 censuses.

Central Cities (of an SMSA).—The largest city in an SMSA is always a central city. One or two additional cities may be added to the SMSA title and identified as central cities on the basis of the following criteria:

1. The additional city or cities must have a population of one-third or more of that of the largest city and a minimum population of 25,000, or
2. The additional city or cities must have at least 250,000 inhabitants.

Urbanized Areas (UA's).—An urbanized area contains a central city (or twin cities) meeting the same criteria used in defining an SMSA, plus the surrounding closely settled incorporated and unincorporated areas which meet certain criteria of population size or density. Beginning with the 1950 census, statistics have been presented for urbanized areas, which were established primarily to distinguish the urban from the rural population in the vicinity of large cities. They differ from SMSA's chiefly by excluding the rural portions of counties that make up the SMSA's as well as those places which are separated by rural territory from the densely populated fringe around the central city. Because UA's are defined on the basis of population distribution at the time of a decennial census, their boundaries tend to change in each census.

There were 252 urbanized areas recognized in the 1970 census, more than the number of SMSA's because several SMSA's include two noncontiguous urbanized areas, though counterbalanced somewhat by the fact that the New York, Chicago, and Los Angeles urbanized areas encompass the urbanized territory in two or more adjacent SMSA's. The urban fringe is that part of an urbanized area outside of a central city and includes the following:

1. Incorporated and unincorporated places with 2,500 or more inhabitants;
2. Incorporated places with less than 2,500 inhabitants, provided each has a closely-settled area of 100 dwelling units or more;
3. Adjacent unincorporated areas with a population density of 1,000 or more inhabitants per square mile;
4. Other adjacent areas with lower population density that serve to smooth the boundary or link densely populated contiguous areas.

In 1974, the Census Bureau modified the criteria for central cities of UA's and designated 27 new UA's for a total of 279 UA's. The change in criteria for UA central cities parallels the change in standard metropolitan statistical area criteria issued by the Office of Management and Budget in November 1971. This modification extends UA recognition to certain cities of between 25,000 and 50,000 which have a total of 50,000 or more when densely settled communities adjacent to the city limits are included. Population, land area data, and maps for the 27 new UA's are presented in PC(S1)-106 **Population of Urbanized Areas Established Since the 1970 Census, for the United States: 1970.**

Standard Consolidated Areas (SCA's).—In view of the special importance of the metropolitan complexes around two of the Nation's largest cities, New York and Chicago, several contiguous SMSA's, together with additional counties that did not meet the formal integration criteria but do have other strong interrelationships, were combined into SCA's known as the New York-Northeastern New Jersey SCA and the Chicago-Northwestern Indiana SCA. The New York-Northeastern New Jersey SCA was made up of the New York, N.Y. SMSA, Newark, N.J. SMSA, Jersey City, N.J. SMSA, Paterson-Clifton-Passaic, N.J. SMSA, and Middlesex and Somerset Counties in New Jersey. The Chicago-Northwestern Indiana SCA was made up of the Chicago, IL. SMSA and Gary-Hammond-East Chicago, IN. SMSA.

In 1976, the SCA concept was broadened and retitled; 13 areas have now been defined under the title Standard Consolidated Statistical Areas (SCSA's). These new statistical areas are composed of two or more contiguous SMSA's which meet certain criteria of population size, urban character, social and economic integration, and contiguity of urbanized areas.

The SCSA's as now defined are:

1. Boston-Lawrence-Lowell, MA-NH
2. Chicago-Gary, IL-IN
3. Cincinnati-Hamilton, OH-KY-IN
4. Cleveland-Akron-Lorain, OH
5. Detroit-Ann Arbor, MI
6. Houston-Galveston, TX
7. Los Angeles-Long Beach-Anaheim, CA
8. Miami-Fort Lauderdale, FL
9. Milwaukee-Racine, WI
10. New York-Newark-Jersey City, NY-NJ-CT
11. Philadelphia-Wilmington-Trenton, PA-DE-NJ-MD
12. San Francisco-Oakland-San Jose, CA
13. Seattle-Tacoma, WA

Census tracts.—Census tracts are generally small, relatively permanent areas into which metropolitan and certain other areas are divided for the purpose of providing statistics for small areas that will be comparable over time. Tracts are designed to be relatively homogeneous areas at the time of establishment with respect to population characteristics, economic status, and living conditions; the average tract contains about 4,000 residents. All SMSA's recognized at the time of the 1970 census were completely tracted. In addition, over 2,300 census tracts were recognized in non-SMSA cities and counties. The 1970 census total was about 34,700 tracts. It is estimated that there will be over 40,000 census tracts in the 1980 census.

Tract boundaries are established cooperatively by a local census committee and the Census Bureau in accordance with guidelines that impose limitations on population size and specify the need for visible boundaries. Geographic shape and areal size of tracts are of relatively minor importance. Tract boundaries are established with the intention of being maintained over a long time so that statistical comparisons can be made from census to census. However, occasional changes may be made in tract boundaries due to physical changes in street patterns caused by highway construction, park development, urban renewal programs, etc.

Enumeration Districts (ED's).—These areas averaged about 800 people or 250 housing units and were defined by the Census Bureau. They were used to control the collection and tabulation of the 1970 census data for the conventional enumeration areas (i.e., for areas not covered by computerized address coding guides). Two administrative factors play a part in determining the geographic definition of enumeration districts. First, the estimated population size of the ED should constitute an adequate enumerator workload. Second, the enumeration district must not cross the boundaries of any area for which data are to be tabulated (i.e., census tracts, MCD's, places, congressional districts, wards, or other areas except blocks). About 142,000 ED's were created for the 1970 census.

Block groups.—This area is a combination of contiguous blocks having an average population of about 1,000. Block groups are subdivisions of census tracts in areas covered by Address Coding

Guides, (i.e., in the urbanized area of 145 SMSA's) where ED data are not available. They are the equivalent of enumeration districts for purposes of providing small-area population and housing data. Block groups are typically defined without regard to the boundaries of political or administrative areas such as cities, minor civil divisions, or U.S. congressional districts. Each block group is identified by a one-digit numeric code which is unique within a census tract and is determined by the first digit of the three-digit block number. For example: Block group "1" would contain all blocks in the range 101-199 within a given tract.

Blocks.—A census block is a well-defined piece of land, bounded by streets, roads, railroad tracks, streams or other features on the ground. Blocks do not cross census tract boundaries, but may cross other boundaries such as city limits. Blocks are the smallest areas for which census data are tabulated. Data were tabulated and published for all blocks located in the urbanized areas of 233 of the SMSA's existing at the time of the 1970 census. Block data were also tabulated and published for approximately 1,000 cities and other areas that contracted with the Census Bureau for preparation of block statistics. (For a list of these contract block areas, see **Data Access Description,** No. 15, "Contract Block Statistics Program".) There were over 1,700,000 blocks in the 1970 census. The number of blocks recognized in the 1980 census will increase not only as urbanized areas have grown, but also because blocks will be tabulated for all cities of 10,000 inhabitants or more outside urbanized areas.

Urban and Rural Areas.—As defined by the Census Bureau, the urban population comprises all persons living in urbanized areas and in places of 2,500 inhabitants or more outside urbanized areas. The urban population consists of all persons living in:

1. places of 2,500 inhabitants or more incorporated as cities, villages, boroughs (except Alaska), and towns (except in the six New England States, New York, and Wisconsin);
2. census-defined unincorporated places of 2,500 inhabitants or more; and
3. other territory, incorporated or unincorporated, included within urbanized areas.

The population not classified as urban constitutes the rural population. The rural population is subdivided into the rural-farm population, which comprises all rural households living on farms, and the rural-nonfarm population, which comprises the remaining rural population.

Other Geographic Areas Associated with the 1970 Census of Population and Housing

U.S. Congressional Districts.—These 435 areas are defined by State legislatures for the purpose of electing persons to the U.S. House of Representatives. The census of population and housing is the only source from which statistics for the congressional districts are tabulated. Published 1970 census reports include population totals and selected characteristics for each congressional district. These are found, along with much other census data, in the **Congressional District Data Book.** Outline maps showing boundaries of districts are found in the **Congressional District Atlas** and GE-50 map No. 72 for the 95th Congress.

Wards.—Wards are political subdivisions of incorporated places used for voting and representation purposes. Wards were reported in one 1970 supplementary report for places of 10,000 or more which provided ward boundary information: PC(S1)-9, **Population of Places of 10,000 or More by Wards: 1970.**

County Groups.—County groups are geographic areas used in conjunction with the 1970 public-use microdata samples. The 409 county group areas identify economically related groups of counties, each of which contains at least 250,000 persons, in order to meet confidentiality criteria for public-use samples. Each SMSA of 250,000 or more population is a county group or can be defined in terms of two or more county groups. County groups frequently cross State boundaries. The public-use samples are a collection of 1970 census records (microdata) for individual persons and households with names and addresses removed. Information concerning County Group Public-Use Samples can be found in **Data Access Description,** No. 24, "Public-Use Samples of Basic Records from the 1960 and 1970 Censuses" and in a supplement (BC-81) entitled "Areas Defined on County Group Public Use Samples".

State Economic Areas (SEA's).—SEA's are single counties or groups of counties within a State, designed in the 1950's to be relatively homogeneous with respect to economic and social characteristics. Boundaries were drawn in such a manner that each economic area had certain significant characteristics which distinguished it from adjoining areas. SEA's were revised slightly in 1960 and were virtually unchanged for 1970. There were 510 SEA's in the 1970 census. SEA's are found only in two subject reports in the 1970 census: Subject Reports PC(2)-2E, **Migration Between State Economic Areas,** and PC(2)-10B, **State Economic Areas.**

ZIP Code areas.—ZIP Code areas were a new type of area for which 1970 census data were summarized. Fifth count summary tapes are the only source for population and housing data by ZIP Code areas. **Data Access Description,** No. 36, "1970 Census Fifth Count for ZIP Codes, Counties, and Smaller Areas," discusses the availability of ZIP Code data. ZIP Code data are used frequently by market researchers, hospital administrators, and others whose mailing lists or client records are ordered by ZIP Code. There are several disadvantages in using ZIP Code areas for statistical purposes: the areas were not designed with statistical use in mind—they are heterogeneous, the boundaries change over time, and maps are not generally available. Nationwide, ZIP Code data from the 1970 census are available only for three-digit ZIP Codes, except that data for five-digit ZIP Code areas are provided within SMSA's. ZIP Code areas seldom cross State lines, but frequently cross county, SMSA, and city boundaries.

Appendix B

GEOGRAPHIC AREAS ASSOCIATED WITH THE 1972 ECONOMIC CENSUSES

This appendix provides a summary of the geographic areas for which the Census Bureau tabulates statistics for the economic censuses program and includes definitions for those areas not covered in appendix A. The 1972 Economic Censuses included the censuses of construction industries, manufactures, mineral industries, retail trade, wholesale trade, transportation, and selected service industries. Further information about the 1972 Economic Censuses can be found in the **Mini-Guide to the 1972 Economic Censuses,** available for $1.00 from the Subscriber Services Section, Bureau of the Census, Washington, D.C. 20233. A **Mini-Guide to the 1977 Economic Censuses** is also available.

Compatability of data from the 1970 and 1972 censuses is affected by boundary changes for two types of areas: SMSA's and incorporated places. Many SMSA's changed their boundaries between February 1971 and August 1973 (the reference dates for the delineation of SMSA's for the 1970 and 1972 censuses). Further, there were only 247 SMSA's for the 1970 census while there were 267 SMSA's for the 1972 census. These changes and additions are highlighted on the comparative SMSA map found in the centerfold and in the accompanying text, map, and figures in appendix A. The only SMSA changes between the 1972 and 1977 censuses are the new SMSA's listed on page 25.

Incorporated places in many States carried out boundary changes due to annexations and/or deannexations between the two census years. About 50 percent of incorporated places changed their boundaries between the reference dates for the 1970 and 1972 censuses. Also, some new places were incorporated and a few went out of existence by merger or disincorporation.

As with the census of population and housing, data collected in the economic censuses are provided for the following geographic areas:

- the United States
- Geographic regions of the U.S.[1]
- Geographic divisions of the U.S.[1]
- States
- Counties
- Standard consolidated areas[2]
- Standard metropolitan statistical areas

Data are also provided for the following areas, subject to certain criteria:

- Incorporated places of 2,500 inhabitants or more in 1970.
- Unincorporated places of 25,000 inhabitants or more in 1970.
- Minor Civil Divisions (towns) in New England with 2,500 or more urban population, or with a total population of 10,000 or more in 1970; and townships in New Jersey and Pennsylvania with a population of 10,000 or more in 1970.

Economic censuses data are not tabulated for census tracts, census county divisions, enumeration districts, block groups, blocks, U.S. congressional districts, wards, or ZIP Code areas. The relatively small number of business establishments and the sensitivity of the data to the confidentiality restrictions imposed by Title 13 of the U.S. Code severely limit the amount of economic census data that can be provided for small places, counties, or even SMSA's. However, for areas with high concentrations of retail establishments, small areas are defined which are not recognized in the population and housing censuses: Central Business Districts and Major Retail Centers (including Downtown Business Areas). See figure B-1 for an example of a Central Business District/Major Retail Center map.

Special areas for which economic censuses data are tabulated include:

- Central Business Districts
- Major Retail Centers
- Downtown Business Areas
- Travel Regions
- Production Areas
- Oil and Gas Districts

Central Business Districts (CBD's).—For the 1972 Census of Retail Trade the CBD is defined as an area in a city of 100,000 or more which has high land value; a high concentration of retail businesses, offices, theaters, hotels, and service businesses; and high traffic flow. The CBD is defined in terms of existing census tract boundaries and may comprise one or more whole tracts. CBD data are shown for the census of retail trade only.

For the 1977 Economic Censuses, CBD's will still be defined as "areas of high land valuation" delineated by census tract boundaries. However, there will no longer be a distinction drawn between CBD's and Downtown Business Areas (DBA's) defined below. DBA's established in previous census years will now be called CBD's. The kind-of-business detail provided for

[1] Regions and divisions were summarized in a number of 1972 Economic Censuses census reports, but are not often summarized in 1977 Economic Censuses census reports.

[2] Standard consolidated statistical areas replace SCA's for 1977.

CBD's will be varied according to the number of retail establishments in the CBD rather than the population size of the central city. Some 1972 CDB's have been modified for the 1977 censuses, and new CBD's have been established in many of the remaining central cities and other cities with at least 50,000 inhabitants based on the 1970 census.

Major Retail Centers (MRC's).—The MRC is a concentration of retail stores, located in standard metropolitan statistical areas, but outside the Central Business District, which has at least $5 million in retail sales and at least 10 retail establishments during the census year, one of which is classified as a department store. MRC data are shown only for the census of retail trade. MRC's include planned suburban shopping centers as well as unplanned centers, such as older "string street" developments (continuous businesses along a street or highway, with few intersecting cross streets containing any businesses) and neighborhood developments which meet the above criteria.

Where the MRC is a planned center, the boundaries encompass all of the stores in the center, and may include adjacent stores outside of the planned center. Where the MRC is an unplanned center, the boundaries include the block in which the department store is located and all adjacent blocks having at least one general merchandise, apparel, or furniture and appliance store. See figure B-1 for an illustrative map showing a CBD and MRC's.

For the 1977 Economic Censuses, the minimum number of stores required to qualify as an MRC has been increased from 10 to 25. The criterion that an MRC contain a department store has been changed as follows: (1) one of the 25 stores must be a general merchandise store, and (2) the general merchandise store must have at least 100,000 square feet of total floor space. The introduction of these criteria is expected to reduce the number of MRC's reported in the 1977 Economic Censuses.

Downtown Business Areas (DBA's).—The DBA is a specialized type of MRC which is located in an SMSA central city with less than 100,000 population. It is defined in the same manner as a CBD—in terms of whole tracts—rather than in the manner of MRC's which are defined on the basis of field inspection. The level of detail published for DBA's is the same as for MRC's. In the **Major Retail Center** reports for cities of less than 100,000 population the DBA can be recognized by the inclusion of tract numbers in the descriptions of MRC's. DBA's will not be used in the 1977 Economic Censuses and existing DBA's will become CBD's.

Other Special-Purpose Districts.—Some publications from the economic censuses show statistics for areas defined for special purposes. Detailed descriptions of these areas can be found in the publications showing the statistics for these areas. Examples of such areas follow.

Nine "travel regions" have been defined for the National Travel Survey, part of the census of transportation. These areas differ from the four census regions and nine census divisions used to present census of population and housing data. The "travel regions" represent the most natural travel-serving geographic grouping of States within the constraints of the national sample design.

Twenty-seven "production areas" are used in the Commodity Transportation Survey, another part of the census of transportation. They are single SMSA's or clusters of SMSA's selected to represent relatively large but geographically compact concentrations of industrial activity.

Seventeen "oil and gas districts" in California, Louisiana, Texas, and New Mexico, comprising groups of counties, are used to present specialized statistics on petroleum and natural gas industries in the census of mineral industries.

Figure B-1. **Map Showing Central Business District and Major Retail Centers**

Appendix C

MAP PRICES AND AVAILABILITY OF GBF/DIME-FILES

SMSA	Tract Outline Maps[1]	Urban Atlases[2]	Metro-politan Maps[3]	GBF/DIME-Files or ACG[4] (Number of reels)
Abilene, TX	$1.20	-	$12.00	1
Akron, OH	1.50	$2.55	[5]49.50	1
Albany, GA	1.20	-	6.00	1
Albany-Schenectady-Troy, NY	2.25	3.90	24.00	*1
Albuquerque, NM	1.50	-	13.50	1
Allentown-Bethlehem-Easton, PA-NJ	1.50	2.55	21.50	1
Altoona, PA	1.20	-	4.50	1
Amarillo, TX	1.20	-	12.00	1
Anaheim-Santa Ana-Garden Grove, CA	2.80	2.55	21.00	1
Anderson, IN	1.20	-	9.00	*1
Ann Arbor, MI	1.50	-	13.50	1
Appleton-Oshkosh, WI	1.75	-	15.00	1
Asheville, NC	1.20	-	9.00	1
Atlanta, GA	2.25	3.90	42.00	1
Atlantic City, NJ	1.20	-	13.50	*1
Augusta, GA-SC	1.50	-	16.50	1
Austin, TX	1.20	-	15.00	1
Bakersfield, CA	1.50	-	9.00	1
Baltimore, MD	3.90	3.90	51.00	[illegible]
Baton Rouge, LA	1.20	-	13.50	[illegible]
Bay City-Saginaw, MI	1.20	-	12.00	[illegible]
Beaumont-Port Arthur-Orange, TX	1.75	-	21.00	1
Billings, MT	1.20	-	6.00	1
Biloxi-Gulfport, MS	1.50	-	10.50	1
Binghamton, NY-PA	1.20	-	15.00	[illegible]
Birmingham, AL	2.80	2.55	31.50	1
Bloomington-Normal, IL	1.20	-	9.00	*1
Boise City, ID	1.20	-	9.00	1
Boston, MA	2.75	3.90	[7]79.50	2
Bridgeport, CT	1.20	-	[6]22.50	*1
Bristol, CT	.90	-	9.00	1
Brockton, MA	1.20	-	[7]10.50	1
Brownsville-Harlingen-San Benito, TX	1.75	-	13.50	1
Buffalo, NY	1.50	2.55	24.00	*1
Canton, OH	1.75	-	[5]25.50	1
Cedar Rapids, IA	1.20	-	9.00	1
Champaign-Urbana-Rantoul, IL	1.75	-	6.00	1
Charleston, SC	1.75	-	21.00	1
Charleston, WV	1.75	-	16.50	1
Charlotte, NC	1.50	-	15.00	1
Chattanooga, TN	1.20	-	12.00	1
Chicago, IL	4.95	6.00	97.50	4
Cincinnati, OH-KY-IN	2.25	3.90	36.00	1
Cleveland, OH	2.25	3.90	[5]49.50	2
Colorado Springs, CO	1.75	-	15.00	1
Columbia, MO	1.20	-	3.00	-
Columbia, SC	1.50	-	16.50	1
Columbus, GA	1.20	-	12.00	1
Columbus, OH	2.25	2.55	19.50	1
Corpus Christi, TX	1.75	-	24.00	2
Dallas, TX	1.75	3.90	55.50	-
Danbury, CT	-	-	12.00	1
Davenport-Rock Island-Moline, IA-IL	1.50	-	13.50	1
Dayton, OH	1.75	2.55	22.50	*1
Decatur, IL	1.20	-	12.00	1
Denver, CO	2.80	3.90	37.50	1
Des Moines, IA	1.20	-	18.00	3
Detroit, MI	2.25	5.05	72.00	1
Dubuque, IA	1.20	-	3.00	1
Duluth-Superior, MN-WI	1.50	-	13.50	1
Durham, NC	1.20	-	10.50	1
El Paso, TX	1.75	-	15.00	1
Erie, PA	1.20	-	6.00	1
Eugene-Springfield, OR	1.75	-	10.50	1
Evansville, IN-KY	1.20	-	7.50	1
Fall River, MA-RI	1.20	-	39.00	1
Fargo-Moorehead, ND-MN	1.20	-	6.00	1
Fayetteville, NC	1.20	-	12.00	1
Fitchburg-Leominster, MA	1.50	-	10.50	1
Flint, MI	1.20	-	18.00	1
Fort Lauderdale-Hollywood, FL	1.75	2.55	24.00	1
Fort Smith, Arkansas, OK	1.20	-	9.00	1
Fort Wayne, IN	1.75	-	12.00	1
Fort Worth, TX	2.25	2.55	42.00	1
Fresno, CA	1.75	-	15.00	1
Gadsden, AL	$1.20	-	$ 12.00	1
Gainesville, FL	1.20	-	8.00	1
Galveston-Texas City, TX	2.25	-	22.50	1
Gary-Hammond-East Chicago, IN	1.75	2.55	27.00	1
Grand Rapids, MI	1.75	2.55	18.00	*1
Great Falls, MT	1.20	-	6.00	1
Green Bay, WI	1.20	-	12.00	1
Greensboro-Winston-Salem-High Point, NC	1.75	3.90	22.50	*1
Greenville-Spartanburg, NC	1.20	-	13.50	1
Hamilton-Middletown, OH	1.50	-	15.00	1
Harrisburg, PA	1.20	-	15.00	*1
Hartford, CT	1.50	2.55	15.00	1
Honolulu, HI	2.25	2.55	40.00	1
Houston, TX	2.25	3.90	100.00	2
Huntington-Ashland, WV-KY-OH	1.50	-	10.50	1
Huntsville, AL	1.50	-	19.50	1
Indianapolis, IN	2.25	3.90	27.00	1
Jackson, MI	1.20	-	9.00	1
Jackson, MS	1.75	-	12.00	(*)
Jacksonville, FL	1.20	2.55	52.50	1
Jersey City, NJ	2.25	2.55	[8]9.00	1
Johnstown, PA	1.20	-	10.50	2
Kalamazoo-Portage, MI	1.20	-	9.00	1
Kansas City, MO-KS	2.25	3.90	39.00	1
Kenosha, WI	1.20	-	9.00	2
Knoxville, TN	1.75	-	15.00	1
La Crosse, WI	-	-	-	1
Lafayette, LA	1.20	-	6.00	-
Lafayette-West Lafayette, IN	1.20	-	6.00	-
Lake Charles, LA	1.20	-	6.00	-
Lancaster, PA	1.75	-	13.50	1
Lansing-East Lansing, MI	1.50	-	13.50	*1
Laredo, TX	1.20	-	3.00	1
Las Vegas, NV	1.50	-	16.50	1
Lawrence-Haverhill, MA-NH	1.50	-	[7]18.00	1
Lawton, OK	1.20	-	6.00	1
Lewiston-Auburn, ME	1.20	-	12.00	1
Lexington-Fayette, KY	1.20	-	6.00	1
Lima, OH	1.20	-	10.50	1
Lincoln, NE	1.20	-	7.50	1
Little Rock-North Little Rock, AR	2.05	-	18.00	1
Lorain-Elyria, OH	1.75	-	[5]24.00	1
Los Angeles-Long Beach, CA	3.90	6.00	99.00	4
Louisville, KY-IN	2.25	2.55	24.00	1
Lowell, MA-NH	1.20	-	[7]18.00	1
Lubbock, TX	1.20	-	6.00	1
Lynchburg, VA	1.20	-	7.50	1
Macon, GA	1.20	-	10.50	1
Madison, WI	1.50	-	12.00	1
Manchester, NH	1.20	-	15.00	1
Mansfield, OH	1.20	-	7.50	*1
McAllen-Pharr-Edinburg, TX	1.20	-	12.00	1
Memphis, TN-AR-MS	1.50	2.55	22.50	1
Meriden, CT	.90	-	[6]12.00	*1
Miami, FL	1.75	2.55	28.50	2
Midland, TX	1.20	-	6.00	1
Milwaukee, WI	1.75	2.55	42.00	1
Minneapolis-St. Paul, MN-WI	3.10	3.90	67.50	2
Mobile, AL	1.50	-	16.50	1
Modesto, CA	1.20	-	6.00	-
Monroe, LA	1.20	-	9.00	1
Montgomery, AL	1.20	-	6.00	1
Muncie, IN	1.20	-	6.00	1
Muskegon-Norton Shores-Muskegon Heights, MI	1.20	-	9.00	*1
Nashville-Davidson, TN	1.75	2.55	42.00	*1
Nassau-Suffolk, NY	(See New York)		[8]60.00	2
New Bedford, MA	1.20	-	16.50	1
New Britain, CT	1.20	-	21.00	1
New Haven-West Haven, CT	1.20	-	[6]28.50	*1
New London-Norwich, CT-RI	1.50	-	16.50	*1
New Orleans, LA	2.05	2.55	31.50	1
New York, NY-NJ	7.90	7.05	[8]82.50	4
Newark, NJ	3.10	2.55	[8]57.00	2
Newport News-Hampton, VA	1.50	-	19.50	1
Norfolk-Virginia Beach-Portsmouth, VA-NC	2.05	2.55	45.00	*1

See footnotes at end of table.

MAP PRICES AND AVAILABILITY OF GBF/DIME-FILES—Continued

SMSA	Tract Outline Maps[1]	Urban Atlases[2]	Metro-politan Maps[3]	GBF/DIME-Files or ACG[4] (Number of reels)
Norwalk, CT	$1.20	-	$[6]12.00	*1
Odessa, TX	1.20	-	10.50	1
Ogden, UT	1.20	-	36.00	1
Oklahoma City, OK	1.75	3.90	70.50	1
Omaha, NE-IA	2.05	2.55	15.00	1
Orlando, FL	1.75	-	25.50	*1
Oxnard-Simi Valley-Ventura, CA	1.75	-	27.00	1
Paterson-Clifton-Passaic, NJ	1.50	2.55	[8]37.50	2
Pensacola, FL	1.75	-	10.50	*1
Peoria, IL	1.50	-	21.00	1
Philadelphia, PA-NJ	3.90	5.05	64.50	3
Phoenix, AZ	1.50	2.55	49.50	1
Pine Bluff, AR	1.20	-	6.00	1
Pittsburgh, PA	3.90	3.90	110.00	2
Pittsfield, MA	1.20	-	6.00	1
Portland, ME	1.20	-	13.50	1
Portland, OR-WA	2.25	2.55	31.50	2
Providence-Warwick-Pautucket, RI-MA	2.25	2.55	3.90	1
Provo-Orem, UT	1.75	-	9.00	1
Pueblo, CO	1.20	-	6.00	1
Racine, WI	1.20	-	81.00	1
Raleigh, NC	1.20	-	15.00	1
Reading, PA	1.75	-	9.00	1
Reno, NV	1.20	-	10.50	1
Richmond, VA	1.50	2.55	25.50	*1
Riverside-San Bernardino-Ontario, CA	2.25	3.90	48.00	*1
Roanoke, VA	1.50	-	10.50	1
Rochester, MN	1.20	-	6.00	-
Rochester, NY	1.75	2.55	19.50	1
Rockford, IL	1.75	-	10.50	1
Sacramento, CA	2.25	2.55	24.00	1
Saginaw-Bay City, MI	1.20	-	12.00	1
St. Joseph, MO	1.20	-	7.50	1
St. Louis, MO-IL	2.00	3.90	30.00	2
Salem, OR	1.20	-	9.00	1
Salinas-Seaside-Monterey, CA	1.75	-	13.50	1
Salt Lake City-Ogden, UT	1.50	2.55	36.00	1
San Angelo, TX	1.20	-	6.00	1
San Antonio, TX	1.50	2.55	33.00	1
San Diego, CA	2.80	3.90	61.50	1
San Francisco-Oakland, CA	5.40	6.00	109.50	4
San Jose, CA	2.25	2.55	43.50	1
Santa Barbara-Santa Maria-Lompoc, CA	1.75	-	4.50	1
Santa Rosa, CA	1.20	-	6.00	1
Savannah, GA	$1.20	-	$10.50	1
Scranton, PA	1.20	-	13.50	1
Seattle-Everett, WA	2.25	3.90	31.50	2
Sherman-Denison, TX	1.20	-	12.00	1
Shreveport, LA	2.05	-	13.00	1
Sioux City, IA-NE	1.20	-	9.00	1
Sioux Falls, SD	1.20	-	6.00	1
South Bend, IA	1.20	-	15.00	1
Spokane, WA	1.75	-	12.00	1
Springfield, IL	1.50	-	12.00	*1
Springfield, MO	1.20	-	9.00	1
Springfield, OH	1.20	-	6.00	1
Springfield-Chicopee-Holyoke, MA-CT	1.75	2.55	30.00	1
Stamford, CT	1.20	-	[5]13.50	*1
Steubenville-Weirton, OH-WV	1.20	-	9.00	1
Stockton, CA	1.75	-	9.00	1
Syracuse, NY	1.20	2.55	13.50	*1
Tacoma, WA	1.50	-	19.50	1
Tallahassee, FL	1.20	-	7.50	1
Tampa-St. Petersburg, FL	2.25	3.90	43.50	2
Terre Haute, IN	1.75	-	9.00	1
Texarkana, TX-Texarkana, AR	1.20	-	6.00	1
Toledo, OH-MI	1.75	2.55	16.50	1
Topeka, KS	1.20	-	7.50	1
Trenton, NJ	1.20	-	15.00	1
Tucson, AZ	1.50	-	16.50	1
Tulsa, OK	1.50	-	25.50	1
Tuscaloosa, AL	1.20	-	6.00	1
Tyler, TX	1.20	-	10.50	1
Utica-Rome, NY	1.75	-	19.50	1
Vallejo-Fairfield-Napa, CA	1.50	- (See San Francisco)		1
Vineland-Millville-Bridgeton, NJ	1.50	-	13.50	*1
Waco, TX	1.75	-	18.00	1
Washington, DC-MD-VA	6.00	3.90	46.50	2
Waterbury, CT	1.20	-	[6]13.50	*1
Waterloo-Cedar Falls, IA	1.20	-	9.00	1
West Palm Beach-Boca Raton, FL	2.25	-	27.00	1
Wheeling, WV-OH	1.75	-	10.50	1
Wichita, KS	1.50	-	15.00	1
Wichita Falls, TX	1.75	-	9.00	1
Wilkes-Barre-Hazleton, PA	1.20	-	18.00	1
Wilmington, DE-NJ-MD	1.75	-	18.00	1
Wilmington, NC	-	-	9.00	-
Worcester, MA	1.50	-	33.00	1
York, PA	1.50	-	10.50	1
Youngstown-Warren, OH	1.75	2.55	18.00	1

*ACG only. - Represents zero.

[1]Tract outline maps may be purchased from the Customer Services Branch, Data User Services Division, Bureau of the Census, Washington, D.C. 20233. They were also previously published as parts of Census Tracts reports.

[2]Urban Atlases, prepared for the 65 largest SMSA's, are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 or any U.S. Department of Commerce Field Office.

[3]MMS sheets may be purchased from the Customer Service Branch. They were also previously published as part of Block Statistics reports.

[4]ACG--Address Coding Guides, forerunner to the GBF/DIME-Files, were developed in 1968-1969 for parts of 147 SMSA's. They contain address range and geographic identifiers necessary for geocoding. They have been replaced by GBF/DIME-Files in most SMSA's excepting those denoted by an asterisk. GBF/DIME-Files and ACG's are available from the Customer Services Branch.

[5]Northeastern Ohio map series - 76 sheets ($114)-includes urbanized portions of Akron, Canton, Cleveland, and Lorain-Elyria SMSA's.

[6]Southwestern Connecticut map series - 47 sheets ($70.50)-includes urbanized portions of Bridgeport, Meriden, New Haven, Norwalk, Stamford, and Waterbury SMSA's.

[7]Eastern Massachusetts map series - 73 sheets ($109.50)-includes urbanized portions of Boston, Brockton, Lawrence-Haverhill, and Lowell SMSA's.

[8]New York-Northeastern New Jersey map series - 144 sheets ($216)-includes urbanized portions of New York and Nassau-Suffolk (New York) SMSA's and Jersey City, Newark, and Paterson-Clifton-Passaic, New Jersey SMSA's, plus portions of Middlesex, Monmouth, and Somerset counties.

Appendix D

GE-50 AND GE-70 SERIES MAPS AVAILABLE FOR SALE[1]

GE-50 Series (1:5,000,000)

No. 44 – Net Migration by Counties of the United States: 1960-1970 ($1.05)

No. 45 – Population Distribution, Urban and Rural, in the United States: 1970 (95 cents)

No. 46 – Congressional Districts for the 93rd Congress (95 cents)

No. 47 – Number of Negro Persons, by Counties of the United States: 1970 (95 cents)

No. 48 – Negro Population as a Percent of Total Population, by Counties of the United States: 1970 (95 cents)

No. 49 – Number of American Indians, by Counties of the United States: 1970 (95 cents)

No. 50 – Number of Chinese, by Counties of the United States: 1970 (95 cents)

No. 51 – Number of Japanese, by Counties of the United States: 1970 (95 cents)

No. 52 – Number of Persons of Spanish Origin, by Counties of the United States: 1970 (95 cents)

No. 54 – Percent Change in the Negro Population, by Counties of the United States: 1960-1970 (95 cents)

No. 55 – Standard Metropolitan Statistical Areas, Area Defined by Office of Management and Budget: January 1, 1974 (95 cents)

No. 57 – Per Capita Money Income for 1969, by Counties of the United States (95 cents)

No. 58 – Families Below the Low-Income Level in 1969, by Counties of the United States (95 cents)

No. 59 – Number of Owner-Occupied Housing Units, by Counties of the United States: 1970 (70 cents)

No. 60 – Number of Renter-Occupied Housing Units, by Counties of the United States: 1970 (70 cents)

No. 61 – Spanish Population as a Percent of Total Population, by Counties of the United States: 1970 (70 cents)

No. 63 – Ratio of Workers Working in County to Workers Residing in County in the United States: 1970 (65 cents)

No. 64 – Median Cross Rent, by Counties of the United States: 1970 (70 cents)

No. 65 – Median Value of Owner-Occupied Housing Units, by Counties of the United States: 1970 (70 cents)

No. 66 – Owner-Occupied Housing Units as a Percent of All Occupied Housing Units, by Counties of the United States: 1970 (95 cents)

No. 67 – Number of Workers Commuting In and Percent of Workers Commuting Out, by County: 1970 (90 cents)

No. 69 – Percent of Children 5 to 17 Years Old Below the Poverty Level in 1969, by Counties of the United States ($1.35)

No. 70 – Number of Children 5 to 17 Years Old Below the Poverty Level in 1969, by Counties of the United States ($1.35)

No. 71 – Per Capita Retail Sales in the United States by Counties ($1.35)

No. 72 – Congressional Districts for the 95th Congress ($1.20)

No. 73 – Percent Change in Manufacturing Employment by Counties of the United States: 1967 to 1972 ($1.25)

GE-70 Series (1:7,500,000)

No. 1 – Population Distribution, Urban and Rural, in the United States: 1970 ($1.60)

No. 2 – Distribution of Older Americans in 1970 Related to Year of Maximum County Population (70 cents)

No. 3 – Primary Home Heating Fuel, by Counties of the United States: 1950, 1960, 1970 ($1.90)

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[1] U.S. Government Printing Office, Washington, D.C. 20402.

Appendix E

GBF/DIME COMPUTER SOFTWARE

Correction, Update & Extension

CREATE[1]

CREATE is designed to perform two independent operations. In areas where a GBF/DIME-File does not currently exist, it will create a new file using locally coded information transcribed from geographic coding worksheets. In areas where a file already exists, the program will allow a large number of new records to extend the file. The program requires approximately 60 K bytes of usable core.

ADDEDIT-L[1]

ADDEDIT-L edits address ranges along a street feature, checks for ZIP Code consistency and the orientation within and between segments on both street and nonstreet features. Street and nonstreet features are checked to determine whether all segments of the feature will chain together; whether the addresses at the "From" node end of the segments are equal to or lower than the addresses at the "To" node end of the segments; and whether all odd address numbers are on one side of the street and even numbers are on the other. ADDEDIT-L needs 95 K bytes of core.

TOPOEDIT[1]

TOPOEDIT edits the network features of the GBF/DIME-File to determine their validity (i.e., it checks to see that each block is bounded on all sides by nodes). It includes several options, including an option to edit only records in certain tracts, thus eliminating the necessity of editing the network within tracts in which no changes have occurred. TOPOEDIT requires 44 K bytes of core.

FIXDIME II (2 AND C VERSIONS)[1]

FIXDIME II edits corrections for completeness and consistency and inserts the accepted corrections into a GBF/DIME-File. FIXDIME II is supplied in two versions: FIXDIME 2 for agencies which do not intend to correct or insert X-Y coordinates in the GBF/DIME-File during a correction pass of the file and FIXDIME C for agencies which can obtain X-Y coordinates from local sources and want to include them along with other corrections to the file. FIXDIME 2 requires 47 K bytes of usable core; and FIXDIME C requires 60 K bytes of usable core.

FIXCORD[1]

FIXCORD provides the means for correcting erroneous or missing X-Y coordinates into the GBF/DIME-File. FIXCORD calculates the coordinates in the three coordinate systems used in the GBF/DIME System. The minimum core requirement for the program is 40 K bytes of usable core.

NODEDIT[1]

NODEDIT edits the nodes in the GBF/DIME-File, checking to see that each node point can be properly bounded by blocks (i.e., that blocks can be chained around a node). NODEDIT consists of two programs separated by a system sort. NODEDIT requires a computer with 55 K bytes of usable core.

FIXDIME 3[1]

FIXDIME 3 is designed to accomplish all of the functions of FIXDIME II/2 with the additional capabilities to handle changes to existing records on a mass correction basis. FIXDIME 3 requires a computer with 70 K bytes of usable core.

Geocoding

ADMATCH

ADMATCH is designed to prepare a file of address data records and a GBF/DIME-File for transferring geographic codes from the reference file to the appropriate matched address record. The matching is accomplished by building the necessary linkages between the two files. ADMATCH is available in IBM 360/OS and IBM 360/DOS assembler language versions. The OS version requires 34 K bytes of core. The DOS version requires 32 K bytes of core.

UNIMATCH

UNIMATCH is a generalized record-matching system. UNIMATCH can be used for almost any conceivable application by defining, with the UNIMATCH language, the nature of a record-linking operation. UNIMATCH is available in IBM 360/OS assembler language and requires 64 K bytes of core.

ZIPSTAN

ZIPSTAN can be used as an address standardizer for UNIMATCH processing. ZIPSTAN converts addresses into a standardized format by correcting misspelled street components and converting nonstandard abbreviations into a standard form suitable for input to UNIMATCH. ZIPSTAN is written in IBM 360/OS assembler language and requires 75 K bytes of core.

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[1] Written in ANSI COBOL

File Preparation

DACS[1]

DACS can be used for locating polygon centroids and calculating areas for polygons from GBF/DIME-Files. Centroid location is required as input to GRIDS and other computer mapping packages. DACS requires 68 K bytes of core.

POLYGON[1]

POLYGON provides for the definition of polygons for (1) the assignment of local geographic areas (e.g., school districts or transportation zones), and (2) to correct existing polygons (e.g., ZIP Code areas or census tracts). A polygon can be defined either by a string of node points or X-Y coordinate values. The program is written for a computer with 95 K bytes of usable core.

GBF/POLYGUIDE[1]

GBF/POLYGUIDE is designed to collapse a GBF/DIME-File to any geographic unit (e.g., transportation zone or school district) for the purpose of creating a geocoding reference file. GBF/POLYGUIDE accepts the GBF/DIME-File as input and creates a record for each side of the street, and then collapses the address ranges of the block side records along the length of the street within the geographic unit chosen by the user. GBF/POLYGUIDE requires 15 K bytes of usable core.

INTERSECT[1]

INTERSECT restructures a GBF/DIME-File into a file of intersections along street features. Each segment associated with the intersection is identified with its respective geographic codes. To convert the segment file, chain the intersections, and to print the file in intersect chain form requires a computer with 57 K bytes of usable core.

SECS[1]

SECS is designed to detect common errors in the digitizing of GBF/DIME Files. SECS examines all possible pairs of line segments to determine if intersections occur. Intersections constitute errors since GBF/DIME-File segments are, by definition, connected only at their end points. SECS requires 95 K bytes of storage.

STREETS[1]

STREETS is a street and nonstreet feature information display program. It can be used to give insight into the quality of addresses (abbreviations, spellings, etc.) in a GBF/DIME-File. STREETS runs with about 60 K bytes of usable core.

Computer Mapping

EASYMAP[2]

EASYMAP is an inexpensive and simple system for producing choropleth (shaded area) maps from a geographic reference file. EASYMAP requires 72 K bytes of core.

GRIDS[2]

GRIDS is a computer mapping system developed for producing character printed maps. GRIDS has a flexible user-oriented language and has several mapping options available. GRIDS requires 88 k bytes of core.

CENPLOT[2]

CENPLOT is designed to plot the segment records in a GBF/DIME-File, one map sheet at a time at any scale. CENPLOT requires a computer with 128 K of usable core. CENPLOT is capable of producing four-color plots, arrows, legends, and other map features.

Resource Allocation

CARPOL[2]

CARPOL is designed as a large-scale carpool candidate generator. The program generates lists of potential fellow-riders from which a candidate can create his carpool group. The program has a primary search radius based on geographic areas and a secondary search based on nongeographic criteria such as common workdays, hours, and driver/rider specifications. CARPOL requires 88 K bytes of core.

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[2] Written in FORTRAN IV

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